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COAL AGE

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May 3, 1923

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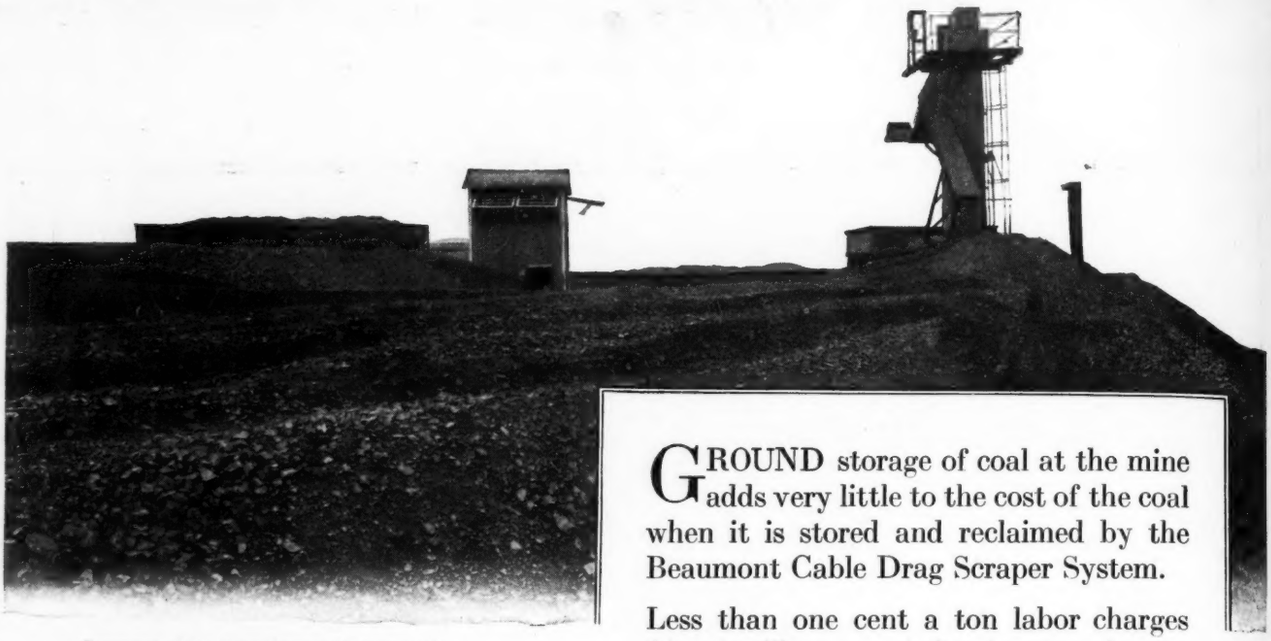
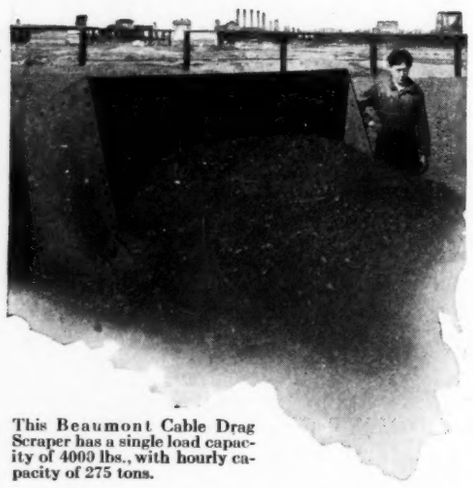


Beaumont Cable Drag Scraper Systems of this type have hourly capacities of 60 to 600 tons of coal stored or reclaimed. Labor costs average less than one cent per ton.



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COAL AGE

The Only National Paper Devoted to Coal Mining and Coal Marketing

C. E. LESHER, *Editor*

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The Massachusetts Pure Coal Law

MASSACHUSETTS is again to the fore. The authorities who procrastinate over an archaic state prison (built in 1801) are prompt and conclusive in dabbling with coal. A governor who deals pettishly with the officer who drove out two corrupt district attorneys now has the credit for forcing through a statute that deserves a place with legislative curiosities. After empowering "the Department of Public Health, local boards of health, the director of standards and local sealers of weights and measures, by themselves or by their authorized agents," to inspect and sample coal wherever "stored or kept for sale," the Pure Coal Law (approved March 23, 1923) includes the following extraordinary provision:

> If, in the opinion of said department or board, upon inspection, analysis or other satisfactory test, said coal is unfit for ordinary use, said department, or said board, with the approval of said department, may condemn, seize and cause the same to be destroyed forthwith or disposed of otherwise than for ordinary use.

The words "anthracite" or "bituminous" occur nowhere in the act; it is "coal" and "opinion," plus confiscation! Like poison is 10 per cent pea in chestnut, and the "health" experts are to determine whether long fracture or rectilinear faces are "fit for ordinary use." And what about drafts and flues? Must the dealer guarantee these also, or suffer seizure and disposal "otherwise than for ordinary use?" Shall he be allowed the comfort of seeing his fellow citizens supply their casual needs from the public dump while he pays the producer? We find ourselves wondering whether in Moscow political genius can match this. "Local sealers of weights and measures" have been modest functionaries, but now is their light no longer hid under a bushel.

But, to continue with this enlightened law:

> Whoever, by himself, or by his servant, agent or employee, sells, exposes or offers for sale, or has in his custody or possession with intent to sell, coal unfit for ordinary use shall be punished by a fine of not more than one thousand dollars or by imprisonment for not more than one year, or both.

There are the teeth. "Quick! To the dump, or we are lost!"

No standards or tests are prescribed. "Opinion" only is to control. The provisions bear dangerous resemblance to decrees of absolutists; they have nothing in common with "due process" or "liberty under law." Like intrastate attempts to regulate trunk lines, such legislation is sophomoric, is based neither on sound principle nor on proper study. But there is still a Constitution, and not to any appreciable degree will neighborhood Rob Roys be permitted to "condemn" and dispossess.

There will be instances of pique and meddlesome interference, doubtless, but the vacation season is coming on. The local sealers and local custodians of the public health will not as a rule persist in "seizure" and "disposal." The act bestows no emoluments save upon hungry laboratories. The volume of really "fireproof" output is egregiously small, and will be precluded from the channels of trade in any case. A few—a very few—operators will blacklist Massachusetts for a time, but anthracite will come forward probably by leaps and bounds during the summer; Massachusetts will have retired her famous Commission on the Necessaries of Life; and in 1924 the electorate will be called upon to give suffrage to eminent statesmen who by once taking thought improved prodigiously the quality of coal for the people.

"It is a great privilege to preside over the destinies of Massachusetts." The rest of the nation must be made aware that pure coal and pure coal only will be received within her borders. Petty annoyances to retail dealers, yes; but dealers are inimical to the public good, anyway, and who cares? And around the whole proceeding, much as in 1903, will gradually fold the mantle of forgetfulness, if only there is no publicist lurking about with an axe to grind!

Publicity, Accusation or Information?

THERE are several reasons why information and statements from the mine workers, the coal operators, the railroads and groups of consumers, as the public utilities, prepared and submitted to the U. S. Coal Commission from time to time should be given to the public. The commission represents the public, and when all the evidence is in it has the responsibility of rendering decisions based on the facts. It is in a measure both judge and jury, with the public in the end passing judgment both on the facts as presented and on the wisdom of the commission. Public opinion therefore should be in the making as the matter of investigation proceeds. Publicity for the high points in the arguments of either side may well be depended upon to prepare the public mind in advance for the final conclusions.

The mine workers, the bituminous-coal operators and the anthracite operators have each been issuing statements to the press as well as to the commission. It is interesting to note the general tenor of these documents. In point of frequency of issue and of prolixity those from Ellis Searles, of the United Mine Workers, carry off first honors. Being a publicist and an able one, Mr. Searles has had an eye on the headline value of his stuff; he has had less concern over fundamental facts than news value. He opened up six months ago with the field to himself, in an attempt to be constructive by urging complete unionization of the coal fields as a cure for all the ills of the industry. This hope and ambition of the union has not subsequently been lost sight of.

The virtues of the United Mine Workers have been expounded, the hardships and hazards, the patriotism and loyalty of the miners set forth. The "Reds" have been denounced and trounced, nationalization of the industry decried. Local strikes have been ascribed to overbearing mine foremen, major strikes described as lockouts by the employers. On the other hand the spokesman for the miners does not hesitate to lay high prices for coal to the conscienceless greed of operators, middlemen and speculators; to charge taking of undue profits. In short, the fault for all that is wrong, both as viewed by the consumer and the digger of coal, is laid at the door of the producer and distributor of coal. Serious enough at the beginning, the "press releases" of the United Mine Workers have descended to mere childish talk. Serious or facetious, the whole effect is that of *publicity*, not of helpful suggestions for the Coal Commission or the public on the very important matter of circumventing strikes.

The anthracite operators have had little to say to the commission. What they have put before it and the public is their record, first with respect to the strike of 1922 and second with respect to their participation in distribution of a short supply of hard coal last winter. In both their performance is clearly shown to have been overwhelmingly exemplary. They do not launch an attack at the miners' union; on the contrary they show the steps taken by the operators to prevent and later to terminate the strike. Mere recital of the things they were ready to do in that direction that the miners refused to consider is sufficient condemnation of the union. They offered the miners last year every possible form of conciliation and arbitration. It seems that they may be excused if the Coal Commission or the miners be now asked to suggest some other avenue of approach to strike prevention. There remain some very important topics for the anthracite industry to discuss, however.

The bituminous-coal operators, on the other hand, have not been telling people how good they are but how very awful the other fellow—the United Mine Workers—is. The soft-coal people have not attempted to prove that they are without reproach, but they have robbed the union of any claim to virtue. The attack has been forceful, direct, condemnatory. The running story of murder and arson by which the United Mine Workers has sought to maintain and extend its monopoly of coal-mine labor is conclusive in its grewsome details. Where does it lead? What does Colonel Stimson think is the answer? Is the union to be torn out root and branch? For its arrogant attitude and high-handed tactics since the war the United Mine Workers is deserving of the two-fisted pummeling the soft-coal operators are handing it but the fact should not be lost sight of that the stronger the case of union power is built, the greater is the evidence of weakness on the part of the operators.

Gloomy indeed will be the picture if all that is painted on the canvas is a hairy giant defying alike the President of the United States and the coal operators while battering at the portals of the non-union fields. The non-union operators may well be expected to resist to their utmost that entrance, but what about the union operators, of whom the majority most certainly would not abolish unionism if they could?

On the whole, as pointed out by Commissioner Marshall recently, this sort of publicity and report to the Coal Commission will get no one anywhere.

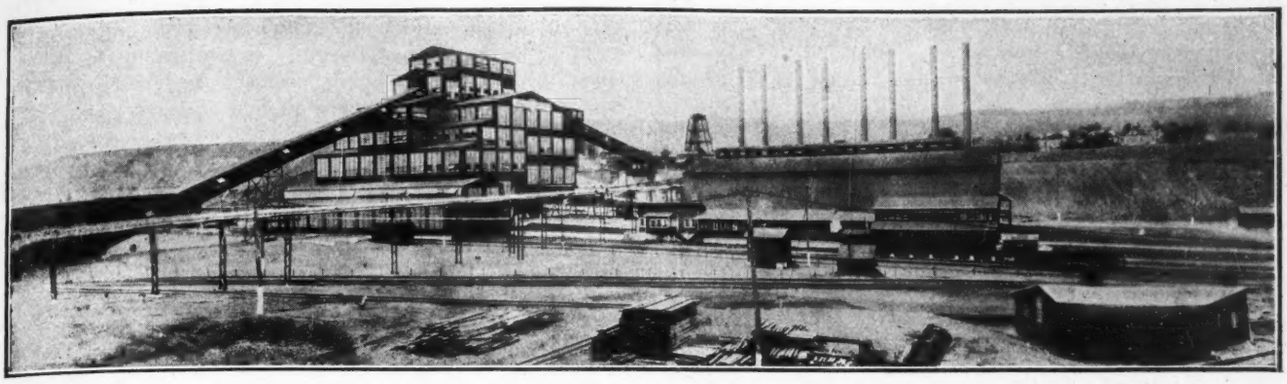
Dock Operators on Defensive

HEARINGS begin this week at the Twin Cities before the Interstate Commerce Commission on the complaint of the Northwest Coal Dock Operators' Association in the matter of the differential between the rail-lake-rail cost of hauling coal from the Appalachian fields and the all-rail rate from the Illinois and Indiana fields. It is the contention of the dock operators, as set forth in their brief to the Coal Commission in February of this year, that the "penalties, restrictions and discriminations against the use of the Great Lakes as a coal route have accumulated since 1916 in such number and in such manner that it can no longer claim the economic relation it has borne to our national transportation system." The specific complaint that is now under consideration concerns only the relation of rates from the upper docks to inland points as compared with the all-rail rates to those same points from Illinois and Indiana, but it is a part of the general campaign to reinstate the pre-war advantage held by Eastern coal in the Northwest.

These same dock operators have just been cited to appear before the Federal Trade Commission and answer to the allegation that they have been maintaining unlawful trade practices in the distribution of their coal. It is alleged, for instance, that the distributors of dock coal have "discriminated in price between different purchasers" and that the effect of this discrimination has been substantially to lessen competition and that it has tended to create a monopoly in the sale of coal. Thus while they are seeking to have restored a differential in freight rates comparable to that enjoyed when the dock coal business was built up, they are called upon to defend the trade practices that have been a factor in building up that business.

Specifically what has happened in the matter of rates is that the Interstate Commerce Commission in the course of advances from 1917 to date, and the Railroad Administration, during the war, have added $1.74 to the pre-war charge on rail transportation for the two short hauls for Eastern coal to destinations in the Northwest and have added $1.17 to the one long haul on coal from the mines in southern Illinois to the same destinations. That is to say, the price advantage for a buyer is now 57c. in favor of Illinois coal as compared to what it was six years ago. This has come to pass because the Interstate Commerce Commission has considered the movement from the mines in the East to a destination in North Dakota, for instance, as two unrelated hauls and has applied each advance in rates to each portion of the haul.

Shippers of Illinois and Indiana coal would like a larger share in the summer business offered by the Northwestern market. Lack of summer trade has always put a deep dent in the production curve of the mines in those fields and the Lake trade has for years put a hump in the production curve of the lake shippers during the summer months. Railroads serving Illinois and Indiana, likewise eager for coal traffic during the summer, have put in effect low rates favoring this long-haul business, as to the Twin Cities. Doubtless it will be contended that if the Western roads have equipment that would otherwise be idle during the summer months there should be no objection to permitting the long haul at the low rate and thus to enable Western shippers to even out their operating curve.



Delaware & Hudson, Chartered a Hundred Years Ago, Opens Mines and Builds Road and Canal to Hudson

Philadelphia Clothiers Prospect Around Carbondale—Try to Enter Philadelphia Market and Lose Heavily—Consequently Build Engine and Gravity Planes to Honesdale and Canal to Rondout—English Engines Purchased and Scrapped

TO THE efforts of the Wurts brothers, members of a prosperous firm of clothing manufacturers in Philadelphia, the Delaware & Hudson Co. owes its existence. They desired to market in New York City the anthracite, or "stone coal," as it was then termed, which they had prospected in the upper valley of the Lackawanna River. The company was incorporated by an act of the Legislature of the State of New York on April 23, 1823, just about one hundred years ago.

The preamble to the act of incorporation explains the general purpose behind the formation of the company. It reads:

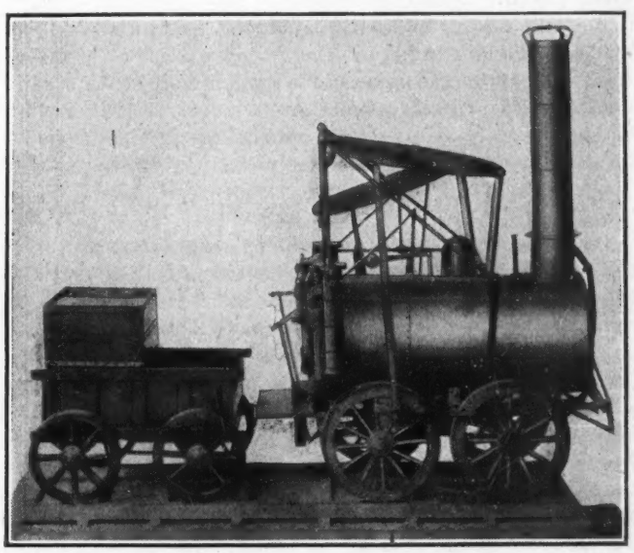
"Whereas, it is desirable that a channel should be opened, through which the City of New York and other parts of this state may receive a supply of stone coal, which is found in the interior of the State of Pennsylvania. And whereas, there is a large body of this valuable article, belonging to Maurice Wurts, in the said State of Pennsylvania, situated near the head waters of the river Lackawaxen, which empties into the river Delaware, opposite the county of Sullivan; and the Legislature of that state has recently passed an act authorizing the above-named individual to improve the navigation of the said river; and whereas, it is represented that a water communication can be formed between the rivers Delaware and Hudson, through the counties of Orange, Sullivan and Ulster, or some one or more of them, so that a supply of this coal may be had from the source aforesaid; and a number of citizens of the state have petitioned the Legislature to incorporate a company for the purpose of making such a communication between the said rivers: Therefore . . . "

This preamble shows both the original purpose behind the forming of the company and the purpose which shaped its course for many years, namely, to mine and distribute anthracite from northeastern Pennsylvania to the State of New York; and, as a natural development, to large portions of New England and Canada lying to the east and northeast of New York.

Until 1867 the Delaware & Hudson continued strictly a canal company so far as its transportation functions were concerned. Actually the canal soon began to operate as a common carrier for freight and, to some extent, for passengers. The records for 1830 show that it carried, among other commodities, 6,012 tons of merchandise, 3,383 tons of water cement, 1,255 tons of manufactured lumber, 75,022 cords of wood and 3,793,000 ft. of lumber.

The company transported this freight in addition to 43,200 tons of its own coal, comprising 1,706 boat loads. With this coal "388 sail of vessels" were loaded for cities and towns on the Hudson, in New Jersey, and the Eastern states.

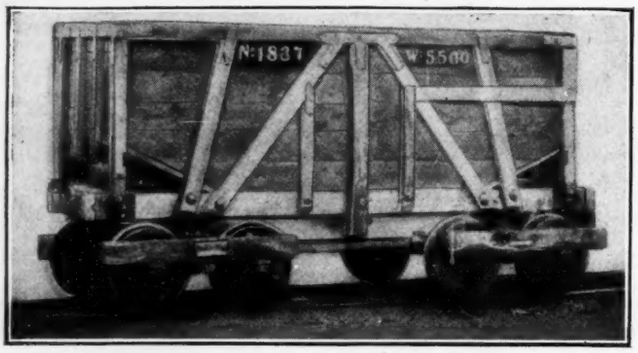
The railroad part of the company's development began in 1867. On May 9, 1867, the Legislature of New



FIRST LOCOMOTIVE TO RUN ON TRACKS IN AMERICA

This, the "Stourbridge Lion," with its long pistons and walking beams, was brought over from England and run two or three times, on Aug. 8, 1829, over a short piece of track. The weight of the locomotive crushed the strap-iron rails into the hemlock timbers on which they were fastened to such a degree that the owners were afraid to put the engine into regular service. Its weight and rigidity made its operation on poor track dangerous. Note the exhaust pipe in the stack and the ineffectual cinder catcher. The locomotive now may be found in the Smithsonian Institution, in Washington.

NOTE—Headpiece shows the Loree breaker of the Delaware & Hudson near Scranton, Pa.



EARLY COAL CAR ON DELAWARE & HUDSON R.R.
No bigger than a large mine car. The gage was 4 ft. 3 in. but every feature of it seems designed to waste available space. The body does not overhang the wheels. The capacity of the car is 2.75 tons. It will be noted that it was provided with a bottom dump.

York amended its charter by empowering it "to construct, own and maintain railroads within this state, to contract with any railroad corporation now existing or hereafter to be created, for the use of its road, for the transportation of coal, to lease the railroad or any part thereof to any incorporated company now or hereafter to be created, upon which said canal company may desire to transport coal, and also to subscribe for and take stock or bonds of, and in, any railroad company which they may lease, or with which they may contract, now existing or hereafter to be incorporated. . . . " The new powers were to be used subject to the General Railroad Law of 1850.

By this act the Delaware & Hudson assumed the additional legal character of a railroad company, and from this beginning dates its interest in railroad construction but more especially in the leases by which it has acquired and now operates its line, running from a point a little south of Wilkes-Barre in Pennsylvania through to New York State, which it enters a little east of Binghamton, and thence continuing with sundry branch lines to Albany, Troy, Rutland and along the west side of Lake Champlain to the Canadian border, from which latter point the affiliated Canadian road extends as far north along the St. Lawrence as Quebec. As a natural consequence of its operation of this railroad line its primitive function as merely a coal carrier has been enlarged to include general freight transportation and a comparatively large passenger business.

When Anthracite Was Not Wanted

In these days, when the chief complaint about anthracite is that there is not enough of it to satisfy the needs of the consuming public, it is not easy to imagine the state of affairs when anthracite, first known as "stone coal," had no standing at all as a fuel and had to be urged upon a skeptical public with almost the same ingenuity and persistence employed now in marketing a safety razor. Only 115 years ago anthracite was, for all commercial purposes, unknown. Earlier than this, however, it was believed that Pennsylvania coal had merits, for at a meeting of the Susquehanna Co. in Windham, Conn., in 1763, the company reserved for itself, to be later disposed of, all beds or mines of coal in all towns which are assumed to be in the State of Pennsylvania, which the company then ordered to be settled.

In Pennsylvania records apparently the earliest reference to anthracite is the original draft of the survey of Sunbury Manor, made by Charles Stewart in 1768. On this draft "stone coal" is noted as having been found on Ross Hill. The earliest use of anthracite for which there is plausible authority seems to have been in 1792. In that year coal pits were opened at Weissport by the Lehigh Coal & Mine Co., and the "brittle compound" was then distributed free of charge to blacksmith shops willing to use it. For sixteen years afterward blacksmiths seem to have been the only users of anthracite, and then only when their shops were near the source of supply.

But on Feb. 11, 1808, Jesse Fell, in Wilkes-Barre, made the experiment of burning common stone coal in the Lackawanna Valley in a grate and found that it would burn. It was not until after the War of 1812, however, that the value of anthracite began to be appreciated seriously. Up to the beginning of that war bituminous coal had been imported from England, and this English coal together with wood and charcoal was the only fuel used for such manufacturing plants as were then in the United States. Not only did the War of 1812 interrupt for a time the importation of soft coal, but when importations were partly renewed the prices were excessively high.

Market Is Induced to Take a Ton a Day

It was about this time that a little anthracite was brought into Philadelphia from the nearer deposits, from which it could be floated down the Schuylkill River. The scantiness of the early production of anthracite is shown by an entry in the diary of Philip Hone, first president of the Delaware & Hudson, who noted, in November, 1839, that only 365 tons of anthracite was sent to the market in 1820. This came from the Lehigh region. He gave the total production in 1839 as over 1,000,000 tons. The fuel shortage in Philadelphia in 1814 was the initiating cause of the creation of the Delaware & Hudson Co., in 1823.

Beginning their search for anthracite apparently about 1814, the Wurts brothers had to undergo nearly ten years of arduous and sometimes rather costly pioneering before their scheme took on the actual promise of fulfillment. The rugged country of the upper Lackawanna was heavily forested and sparsely settled, and in their search for outcroppings of anthracite and their attempt to locate areas promising to supply large quantities of it they put up with what well might be called frontier hardships.

As early as 1816 they seem to have mined a small quantity of anthracite which they were unable to get to market. About 1822 they reached the site of the present town of Carbondale, gave it that name and made their settlement there, their party building the rough log house which was the first building in the town, later known as the Old Log Tavern. They had bought some coal lands, and at Carbondale in 1822 they opened a rude drift which later became the nucleus of the first mines of the Delaware & Hudson Co. By the autumn of that year they had mined at Carbondale nearly a thousand tons of anthracite.

The following winter, that of 1822-23, they succeeded in getting some of this coal to Philadelphia, carrying it part of the way on sleds and the rest of the way by rafts on the Lackawaxen and Delaware rivers—about one hundred tons in all. They managed to sell their coal, but seem to have found that the market was already more efficiently supplied with Lehigh coal, the first shipments of which had come to the city in 1820. This first transportation of their coal to Philadelphia

was accomplished only after great difficulties. They tried several different watercourses, and even in their final rafting down the Delaware some of their rafts went to pieces on rocks and much of the coal that they had loaded was lost.

Apparently the Wurts brothers had realized even before this attempt that the Philadelphia market would be difficult to reach and also that even when there they would meet the competition of the Lehigh and Schuylkill coal at a great disadvantage to their own product. In consequence, before the year 1823 they began to consider how they could reach the New York market.

Hill That Ramparted Wyoming Valley on East

To the east of Carbondale is a ridge 858 ft. above the present site of that city and 550 ft. above that of Honesdale, on the Lackawaxen River, which flows into the Delaware. In casting their eyes toward New York, the Wurts brothers discovered that New York was little more than a hundred miles away, and sundry explorations and map studies led to their developing the idea of taking their coal from Carbondale over the ridge to the Lackawaxen, canalizing not only that river to its junction with the Delaware but a short stretch of the larger river also, and then building from the Delaware a canal to the Hudson River.

Realizing that any such undertaking as this would be too much for their own resources, the Wurts brothers prepared maps of their coal properties around Carbondale and the relation of those fields to the Hudson River, and circulated these in influential business circles in New York City, hoping by this means to enlist support for their project. They also obtained from the Pennsylvania Legislature, on March 13, 1823, the passage of an act which authorized Maurice Wurts and others to canalize the Lackawaxen River.

This right to improve the Lackawaxen, together with possession of their coal lands, gave them something with which to approach New York financial interests. Although their plan to build a canal to bring their coal to New York was much criticized, the public was nevertheless strongly in favor of canal building. In consequence they obtained enough support that they were able to find signers to a petition urging their claims before the New York Legislature and to move that body to grant, in 1823, the charter of the Delaware & Hudson Co.

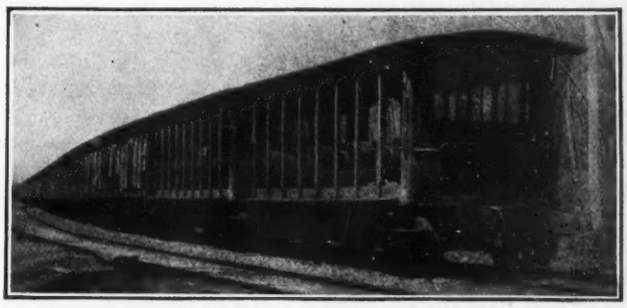
Engineer Plans Inclines and a Canal

That same year they engaged Benjamin Wright, who had been chief engineer of the Erie Canal, to make a survey of the line of the proposed canal from the Hudson River to the Delaware. Mr. Wright recommended a route, together with details of construction, and estimated the cost at about $1,300,000. Under Mr. Wright's plans a canal was to be used to furnish a highway from the Hudson to Honesdale on the Lackawaxen, and a railway was to be built to cross the ridge between Honesdale and Carbondale. This latter, when built, formed the famous gravity railroad.

Further legislation by the State of Pennsylvania authorized the Delaware & Hudson Co. to acquire the rights of the Wurts brothers in the canalizing of the Lackawaxen River, and the whole project was then in a state to present to investors.

It was not until January, 1825, that subscription books to the company's stock were opened, in the Tontine Coffee House, at the northwest corner of Wall and Water Streets, and at two other places. The capital stock of $1,500,000 was quickly oversubscribed. On March 8, 1825, again at the Tontine Coffee House, in New York, the first board of managers of the Delaware & Hudson Co., consisting of thirteen members, was elected. On March 9 these managers organized and on March 11 elected Philip Hone as president of the company and John Bolton as treasurer.

The election of Mr. Hone gave the new Delaware & Hudson Co. much prestige, for he already was prominent in the business of the city and had acquired what was for those days, a comfortable fortune. He had wide and influential connections both socially and politically. He had retired from active business in 1820 at the age of 40. At that time he lived in a house at No. 235 Broadway, near the corner of Park Place, where now stands the Woolworth Building. In 1824 Mr. Hone was elected as Assistant Alderman of the City of New York, and in 1826 Mayor of the city, which office he held for one year. In 1816 he had been appointed by the Legislature a trustee of the first savings bank established in this country, and he was officially promi-



SUMMER COACHES ON GRAVITY RAILROAD

These coaches have the look of American street cars with their open side and long seats. They were fitted for use only during the warm summer months, when pleasure rather than business was the reason for travel.

nent in many other institutions. Politically he was a strong Federalist, and later a Whig, being credited with having given that name to the party. Work began on the canal July 13, 1825.

Until March, 1825, the Delaware & Hudson Co. had no office in New York, but having been authorized by the Legislature in the preceding November to use $500,000 of its capital in transacting a banking business, it bought No. 13 Wall Street and there opened the Delaware & Hudson Canal Company Bank, which was conducted at that spot until 1844, when the twenty-year period set by the charter of the Legislature came to an end. The new bank stood on the north side of Wall Street just east of Nassau on ground now covered by the United States Sub-treasury. It was directly across the street from the present site of the banking house of J. P. Morgan & Co.

By the winter of 1826-1827 it began to be clear to the managers of the Delaware & Hudson Co. that Wright's estimates of cost for the canal were too low, and it was then determined to ask the State of New York for aid. As the result of the company's appeal the act of March 10, 1827, authorized the issue of $300,000 of state stock in the canal company, for which loan the company was to pay interest at the rate of 5 per cent. A second state aid, of $200,000, was authorized by the act of May 2, 1829, to carry interest at 4½ per cent. These two loans were repaid by the Delaware & Hudson

Co. at their respective maturities, Jan. 1, 1848, and Jan. 1, 1850.

Following this grant, the first financial assistance of the State of New York to projects of this character, contracts for the entire length of the canal were let, in April, 1827, and construction was energetically resumed. The canal was completed in the autumn of 1828 and the first squadron of canal boats, from Honesdale, passed through the canal and arrived at Rondout, the Hudson River terminus, on Dec. 5, 1828.

The *Albany Argus* of Dec. 13 of that year gives this description of the canal, remarking that fifty tons of the first shipment of coal "had been consigned to the Messrs. Townsend, which will afford our citizens an opportunity of testing its quality."

"This canal," continues the *Argus*, "is 32 to 36 ft. wide upon the water line and is 4 ft. deep. The locks are 76 ft. in length between the gates and 9 ft. wide, and the coal boats are estimated to carry 25 to 30 tons.

"From the mouth of the Rondout, where it connects with the Hudson, to Port Jervis, near the Delaware River, is a distance of 59 miles; on this section are 60 lift locks and one guard lock of hammered stone laid chiefly in hydraulic cement. There also are one aqueduct over the Neversink River, 234 ft. in length, upon stone piers and abutments; one over the Rondout entirely of stone, upon two arches, one of 60 and the other of 50 ft. chord, and ten others of various dimensions, upon stone piers and abuttments over lateral streams; 15 culverts of stone, and 95 bridges having stone abuttments and wing walls.

"Port Jervis is less than a mile from Carpenter's Point, formed by the junction of the Neversink and Delaware rivers, and at which point the States of New York and New Jersey corner upon Pennsylvania. Port Jervis presents a view of the territory of three states, and also of the Delaware River and the fertile valley of the Neversink. From this point the line of the canal is carried along the east side of the Delaware to a point opposite the mouth of the Lackawaxen River. At this place a dam has been erected across the Delaware, by means of which the canal is fed and boats cross the river. From McCarthy's Point, which is formed by the junction of the Lackawaxen with the Delaware, the canal follows up the valley of the Lackawaxen, 25 miles to the forks of the Dyberry, at which point the canal terminates and where a thriving village is already established called Honesdale.

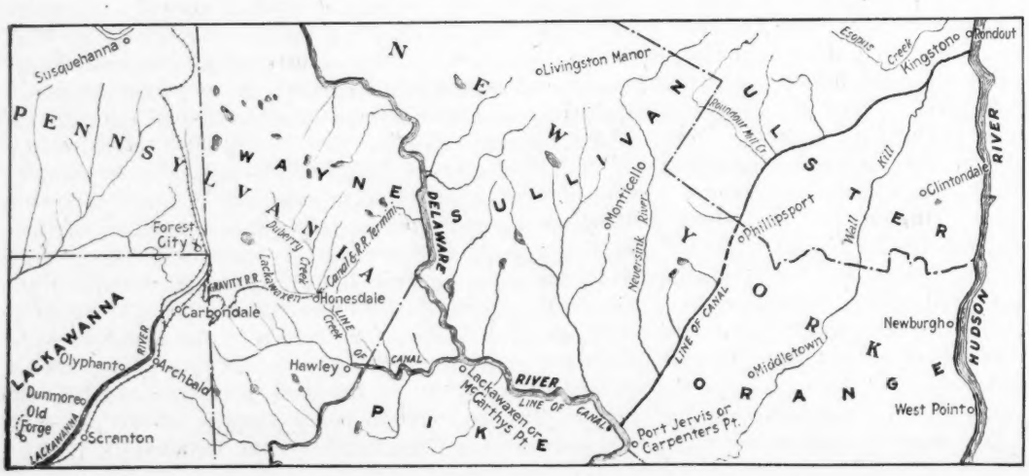
"On the Delaware section of 22 miles there are 15 wooden locks, and on the Lackawaxen section of 25 miles are 37 locks of the same description. These locks are secured by a substantial dry stone wall, and so constructed that the wooden lining can be taken out and replaced without disturbing the rest of the lock."

Though the canal afterward was greatly enlarged in capacity and the depth of water increased so that boats of nearly 200 tons capacity finally were used, to the public of this day the most interesting item in these changes probably is the four suspension aqueducts which were constructed in 1849 as the culmination of the improvements made during the forties. John A. Roebling, whose name has since become inseparably linked with the construction of the first Brooklyn Bridge, suggested the plans for these aqueducts, constructed them, and supplied the cables. By these aqueducts the canal was carried across the four rivers, those crossed from east to west being the Rondout, the Neversink, the Delaware and the Lackawaxen. The Delaware aqueduct was carried on wire cables 8½ in. in diameter.

Provision was made for passenger traffic on the canal by the building of two packetboats with accommodations for twenty passengers, meals being supplied on board. An advertisement of this service, which began Oct. 7, 1829, as published in the *New York Morning Courier and Inquirer*, shows that the fare from the eastern terminus, near Kingston, to Honesdale, was $4. The charge for way passengers was 5c. a mile. The westbound boat left the eastern terminus at 7 a.m. and the eastbound boat left Honesdale at 6 a.m. on Mondays, Wednesdays and Fridays, making the whole trip in 36 hours. Mr. Hone's diary gives the details of some trips he made over the canal in this fashion.

The gravity railroad, by which coal was taken from Carbondale over the 858-ft. ridge to the east and thence down to Honesdale on the Lackawaxen, where the coal was put aboard canal boats, consisted of a series of fairly steep inclines, alternating with level or slightly descending sections operated by horses. The inclined planes were first constructed with a single track and turnouts, but in the middle of each plane was a stretch of 100 to 150 ft. of double track, so as to permit of cars passing in opposite directions.

These turnouts were provided with self-acting switches, so that whenever a car passed out of the turnout in either direction the switch was left in such a position as to turn the next car moving in the opposite direction into the side of the turnout thus vacated. On the west side were five long ascending planes with a stationary steam engine at the head of each plane. By means of a long chain extending the entire length of the



Gravity Railroad and Canal

From Carbondale engine planes raised the cars to the summit and gravity planes lowered them to Honesdale. There the coal, dumped into a boat, was floated by canals along the Lackawaxen and Delaware to Port Jervis and thence by another canal to Rondout on the Hudson.

MARVINE BREAKER, WHERE THE COAL IS BROUGHT FROM TWO ROCKHOUSES FOR FINAL PREPARATION
This breaker, which prepares 5,000 tons per day, was started in 1920. Interesting features are the concentrating tables, thickeners and separators and the long conveyor lines connecting the breaker with the two shafts, which are 2,000 ft. apart. The coal receives its preliminary treatment before being taken to the breaker itself.

plane these engines hauled up from three to five loaded cars (each car carrying about 1,500 lb. of coal) and at the same time let down the same number of empty cars which were attached to the other end of the chain.

On the eastern side of the ridge, for the descent toward Honesdale the three descending planes were worked by the force of gravity, without the use of steam; the descending loaded cars drawing up the ascending empty cars attached to the other end of the chain, the speed of their descent being controlled by the use of friction brakes on the shaft of a large upright fan-wheel, which thus furnished braking power by working against the resistance of the air. This original and simple scheme later was much modified, the number of planes from Carbondale to the canal subsequently being increased to eight.

In later years, as the company's mining operations were extended south to Carbondale, the gravity railroad was extended southward as far as Olyphant, and the eastbound, or loaded, and the westbound, or light, tracks were separated, so that in the later arrangement the loaded track had on the east side a single inclined plane into Honesdale somewhat more than ten miles in length. The light, or westbound, track for empties was relocated, taking advantage of the topography, so as to give a nearly uniform line of descent, on which the cars ran by gravity alone from the summit nearly to Archbald, south of Carbondale, in the Lackawanna Valley, a distance of about 13 miles.

Beginning in the summer of 1860 passenger traffic over the gravity railroad in the Lackawanna Valley made a small beginning, and in later years this developed largely, the trip over the ridge being considered quite an excursion. Later John B. Jervis succeeded Benjamin Wright, the planner and engineer of the canal, as chief engineer. He planned to use steam locomotives, then unknown in America, to haul loaded cars down and empty cars up the easy descending planes, as had been suggested when the gravity railroad was first designed.

It was Jervis' recommendations that led the company to send to England in January, 1828, Horatio Allen, a young man of twenty-six, to arrange for the building of four locomotives and also to obtain iron for capping the wooden rails of the roadway. In terms of locomotives, the results of Allen's mission were the locomotive America, designed and built by George Stephenson, the builder of the famous Rocket, and three locomotives of a different type built by Foster Rostrick & Co., of Stourbridge, England.

Stephenson's engine, the America, was the first steam locomotive to be seen in the Western Hemisphere. It arrived at the port of New York on the ship Columbia on Jan. 15, 1829. The engine was taken to the yard of Abeel & Dunscomb, at 365 Water Street, where it was put together, supported on blocks so that the wheels ran free, and then demonstrated under steam from time to time during some three months, many visitors coming to see the wheels go round. Later in the season the America, together with the first of the Foster Rostrick locomotives, was shipped by way of the canal to Honesdale, and from that point all authentic trace of it has been lost until within the past few months.

The second locomotive, which arrived on May 14, 1829, was the Stourbridge Lion, the first steam locomotive to run on rails in America. Like the earlier arrival, the Lion was assembled and set up on blocks in the machinery works of William Kemble and was demonstrated under steam, as the America previously had been. The two locomotives remained in New York until about July 1, when they were sent by sloop up the Hudson to the eastern terminal of the canal, then called Eddyville but in recent years known as Rondout. There they arrived on July 4, reaching Honesdale a few days later.

For some reason not now clear Horatio Allen, who had ordered the two locomotives in England and who was in charge of making the first test on the rails of the gravity railroad, selected the Stourbridge Lion, and early in the forenoon of Aug. 8, 1829, that locomotive was drawn up an inclined plane which had been laid from the side of the canalboat to the railroad track. A fire was built in the firebox with Lackawanna coal, and the steam pressure soon moved to a point sufficient for the trial.

It had been the intention of Mr. Jervis that the locomotive should not put more than 1¼ tons of weight on each of the four wheels, but when the Lion's boiler was filled with water the locomotive was found to weigh over seven tons, two-thirds of which rested on the forward wheels, with the result that the weight on these two wheels was about double that which Mr. Jervis had expected. Some critical observers on learning of this excess of weight predicted that the engine would break down the track on the curved portions of the trestle work by which the road was in places supported, while others, noting that the four wheels were rigidly set on the frame, declared that on curves the driving wheels would climb the outer rail and jump the track.

As these gloomy predictions seemed plausible, Mr. Allen declared he would risk his own neck on the trial, and he, thereupon, acted as engineer, driving the Lion two or three times back and forth over a section composed of straight track and of a curve of 700-ft. radius,

crossing the Lackawanna Creek on a trestle 30 ft. high. The track did not break down and the engine did not climb the rails and jump off, but the result of the test as read afterward in the condition of the wooden rails and the trestles convinced the engineers that the structure would not withstand either the weight of the Lion or the sidethrust of the wheels on curves.

A little later the engineers considered whether it would be possible to rebuild the supported parts of the railroad and the curves in a more solid fashion to withstand the load, but for various reasons this was decided to be impracticable. The Lion was then taken off the tracks, set to one side, and for some fifteen years neglected, and, there is reason to think, partly dismembered, until many years later nearly all its parts were recovered in various places and assembled in the National Museum at Washington. The two sister locomotives of the Lion were received in New York, but owing to the difficulties encountered in the test of the Lion, no attempt apparently was made to use them.

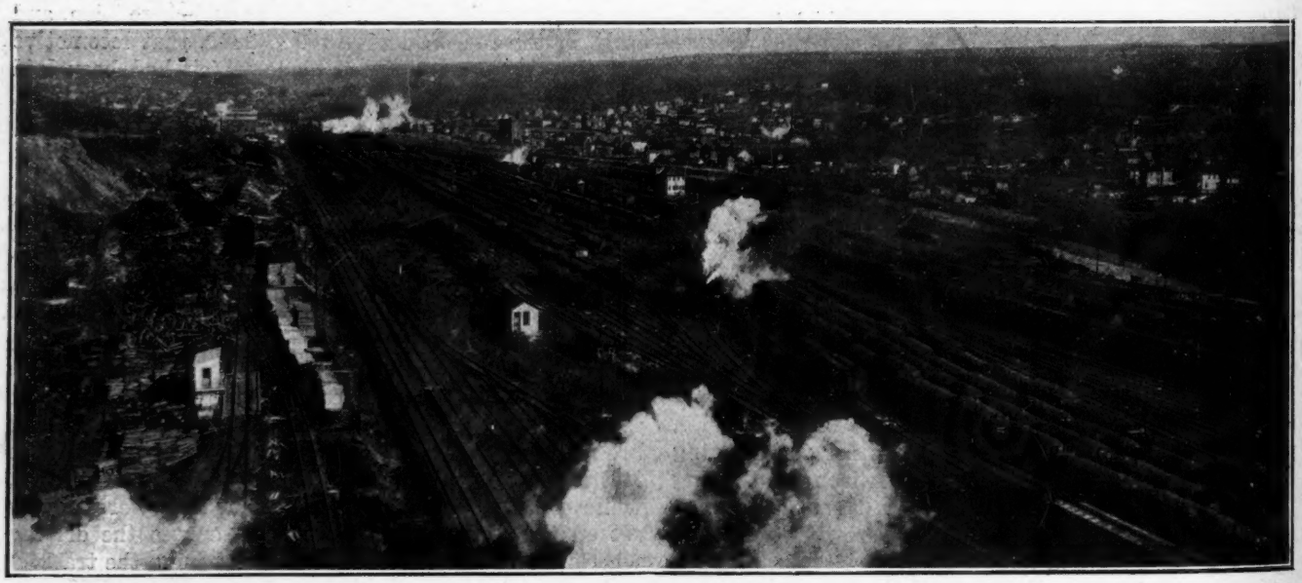
The "Gravity Road" was relocated and improved in 1832 and in 1846 it was practically rebuilt, the location of the inclines being revised and a second track added, this being an independent line with the necessary inclines, one road being known as the "Loaded Track" and the other as the "Light Track." Other modifications were made from time to time, but the "Gravity Road" continued in existence as such and was used for both freight and passenger business until 1899, when it was largely rebuilt and the gage widened to 4 ft. 8½ in., the former gage being 4 ft. 3 in.

At that time regular operation by steam locomotives commenced. The company extended its "Gravity Road" southward from Carbondale along the Lackawanna Valley in 1846 to a point near Archbald, Pa., where the company had purchased additional coal lands, and in 1858 it was extended to a point known as Valley Junction, near Olyphant, Pa. The road was further extended to Providence in 1861 and to Green Ridge in 1863, these last two extensions being operated by locomotives. A portion of the final extension is now the Vine Street Branch in the City of Scranton. The Poplar Street Branch, in the same city, was partly built in 1867 and completed some time prior to 1877.

In 1871 a steam-operated railroad was constructed from Valley Junction northward to Carbondale, practically paralleling a portion of the Gravity R.R. The Jefferson R.R. between Carbondale and Jefferson Junction, built by the Erie, was operated under a trackage agreement, the Delaware & Hudson Co. building its own line from Jefferson Junction to Nineveh in 1871. At the latter point connection was made with the Albany & Susquehanna R.R., which had been constructed between Binghamton and Albany between the years 1863 and 1869.

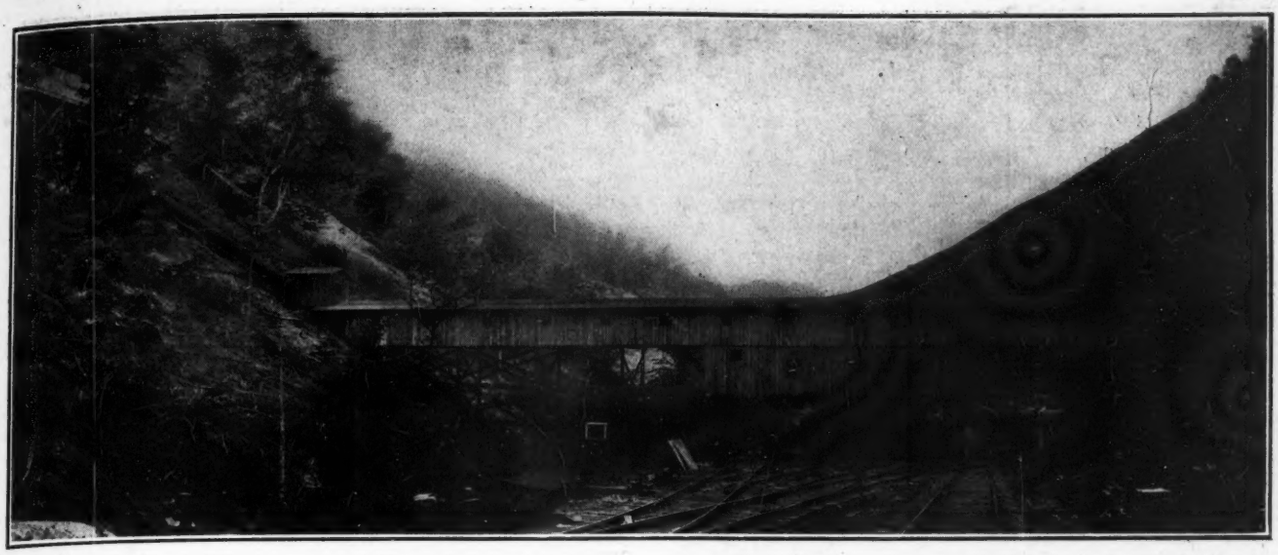
This latter railroad was leased by the Delaware & Hudson Co. on Feb. 24, 1870, giving the company an entrance into Albany. The Cherry Valley Branch, between Cherry Valley and Cobleskill, came into possession of the company on June 1, 1870. These two lines added 164 miles. By a lease dated May 1, 1871, the Rensselaer & Saratoga R.R. and a number of lines that company had leased came into possession of the Delaware & Hudson Co., which extended its line from Albany and Troy to Whitehall, to a connection with steamers on Lake Champlain, with branches from Fort Edward to Glens Falls, from Schenectady to Ballston, from Whitehall to Rutland and from Eagle Bridge to Castleton. These lines were built beginning as early as 1832 and gradually extended and enlarged between that date and 1869. These lines added about 190 miles to the system. A connection with the leased property acquired from the Rensselaer & Saratoga was constructed between Delanson and Schenectady in 1872 and upon completion was acquired by this company by lease, and was merged into the Delaware & Hudson Co. in 1903.

In 1867 a railroad had been constructed southerly from Green Ridge, now a part of the city of Scranton, to a point near Wilkes-Barre by the Union Coal Co. which afterwards, in 1873, was leased to this company. This line was further extended in 1886 to Wilkes-Barre, and in the intervening years branches were acquired in the Plymouth district, where extensive mines of the company were located.



CARBONDALE YARDS WHERE THE COAL IS ASSEMBLED BEFORE BEING DISPATCHED OVER THE HILL TO MARKET

Chance has much to do with early development. The Wurts brothers, seeking to get coal for Philadelphia, looked too far north and found themselves in a territory better suited to supply New York and Albany than the city to which they expected to deliver coal. They soon realized their mistake and directed their efforts to reaching the cities on the Hudson River. After all, the northern end of the Shickshinny-Forest City basin was perhaps about as well situated as any point in the anthracite region for that purpose. Out of their venture came Carbondale and the thriving boroughs to the south.



General Availability and Excellent Quality of Hazard Coals in Eleven Years Make Field Large Producer

Extent and Geological Features of Region—Main Output Comes from Seams Nos. 6 and 4—Coal Is Low in Ash and Sulphur—Ash Fuses Only at High Temperature—Leasing System Aids Rapid Development of Field

By W. Norris Cole
Mining Engineer, Kentucky River Coal Corporation, Hazard, Ky.

As a result of the strike of the coal miners last summer the importance of the Hazard coal field to the nation at last was clearly demonstrated, for it is one of the leading non-union coal areas of southeastern Kentucky. It derives its name from the town of Hazard, the county seat of Perry County, that municipality being situated in about the center of the long southwestern line of the field.

The coal area comprises about 350 square miles and is situated in Perry, Knott and Letcher counties. It is bounded on the north by Lost and Troublesome creeks, on the east by Sandlick Creek and on the south and west by the North Fork of the Kentucky River. (See Fig. 12.)

A mountainous country, having narrow valleys, steep hillsides and innumerable creeks and streams, the field could not be developed properly without the construction of long spur railroad tracks which run up the largest of these creeks from the main line which winds its way on the edge of the field, following the Kentucky River. There are now seven of these main spur lines, which follow First Creek, Lotts Creek, Buffalo Creek, Carrs Fork, Rockhouse Creek, Smoot Creek and Sandlick respectively. The last mentioned of these seven streams forms the boundary between the Hazard and Elkhorn fields, but both the Hazard and Elkhorn coals are mined along the course of this stream. From these main spurs radiate the individual sidetracks of some eighty different operations, each producing from three to sixty cars of coal per day.

The lowest seam is known locally as No. 4 bed. It underlies the entire territory, being quite low in the series. In the state geological report it is known as the "Fireclay" seam, because it contains a persistent parting of from 3 to 6 in. of flint clay called the "jackrock." This readily distinguishes it from the other beds. Some of the operators correlate it with the well-known No. 2 Gas seam of West Virginia.

Its thickness varies from 30 in. to 6 ft. and averages throughout the field about 42 in. Where the seam thins down to 36 in. or lower the "jackrock" forms the bottom, but where the coal is thick the upper bench is

FIG. 1—TIPPLE OF BLUE DIAMOND COAL
This structure spans First Creek. The mine is working the No. 6 seam. The dump-house can be seen in the upper left-hand corner of the illustration.

Note—Headpiece shows tipple of Dudley Coal Co., Blackey, Ky. This tipple spans Caudills Branch. At the left can be seen a steel pipe which is used for lowering coal down the mountain to the tipple. The latter is securely braced between the opposing hillside.

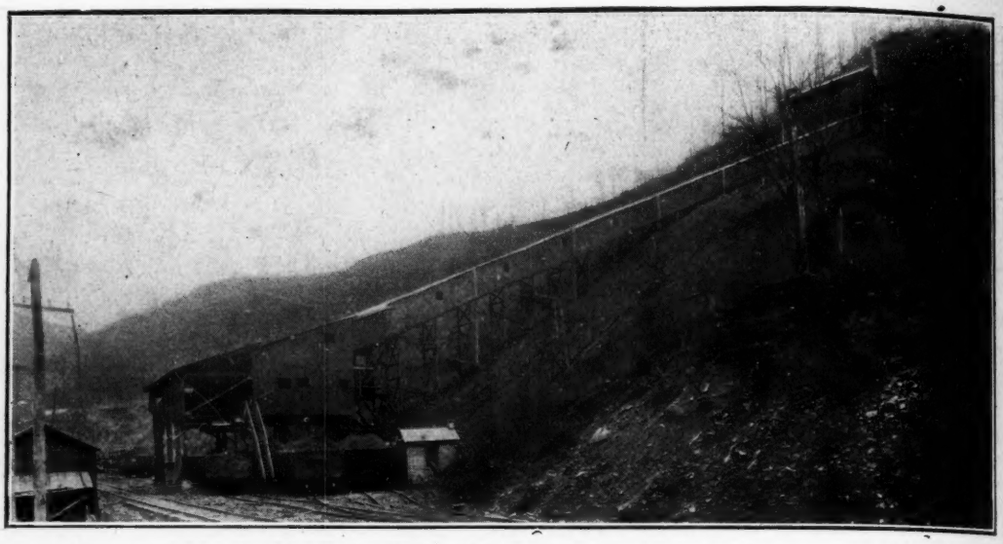


FIG. 2

Tipple of First Creek Coal Co.

This tipple is located at Dowlais, Ky. The coal is brought down an even trestled grade from the dump-house high on the hill, so high in fact that the area mined must be of the many-fingered shape frequently found in this field.

about 42 in. thick and the lower bench is below the "jack."

This No. 4 seam produces an excellent steam and domestic coal that is hard enough to stand shipping well and has a bright luster of a bluish cast. Consequently it makes an excellent appearance. It is low in ash and sulphur, and the ash melts only at a high temperature; consequently it is practically clinkerless even when the furnace fires operate under forced draft. Furthermore it is a good byproduct and gas coal, and in composition it closely resembles the coal of the famous Elkhorn seam, as the following analysis of the product from the two fields will show:

PROXIMATE ANALYSIS OF NO. 4 ELKHORN SEAMS

	No. 4 Hazard Per Cent	Elkhorn Per Cent
Fixed carbon	58.37	60.53
Volatile matter	36.97	35.02
Moisture	1.42	1.53
Ash	3.24	2.90
Sulphur	0.61	0.44
British thermal units	14,482	14,421

About 235 ft. above the No. 4 seam is the No. 5, or Haddix, bed, which apparently is not as persistent as No. 4. It lies immediately below a massive sandstone ledge from 30 to 40 ft. thick. I know of only two openings in this seam where the coal has been worked and there only to a small extent. One is near Yerkes and one on the north side of Troublesome Creek. In both these openings the seam is 36 in. thick, free of partings and of excellent quality. Immediately above the sandstone ledge is the 5A, or Young, seam, which varies in thickness from 36 to 54 in. Like No. 5 seam it has not been much prospected. At Domino, on the Kentucky River, a pair of entries were driven on the Himyar Coal Co.'s property for the purpose of testing the bed and for obtaining house coal. It varied from 36 to 48 in. in thickness and had a small parting which did not appear to be persistent. The coal was of excellent quality, resembling that of the No. 4 seam. On First and on Lotts Creek and also on Hensons Branch the bed is about 50 in. thick with from 8 to 10 in. of fireclay parting near the center of the seam.

About 60 ft. above the No. 5A, or 350 ft. above the No. 4 seam, is the No. 6, or Hazard, seam. At the present stage of development this is commercially the most important seam in the Hazard field, as from it is produced by far the greater quantity of coal coming from this region. It varies in thickness from 4 to 7 ft. and has an average thickness of about 5 ft. over the larger part of the field. The principal operations in this seam are on First Creek and Lotts Creek, where the

FIG. 3

No. 6 Seam at Dowlais

This is the principal bed in the Hazard field, that from which most of the coal comes. Its thickness varies from 4 to 7 ft., and here it is not much less than the higher figure. Yet despite its thickness it is a clean seam, from the bottom to the slightly rolling top. The illustration shows the end of a room in the First Creek Coal Co.'s mine at Dowlais, the underground workings subsidiary to the tipple shown in Fig. 3.

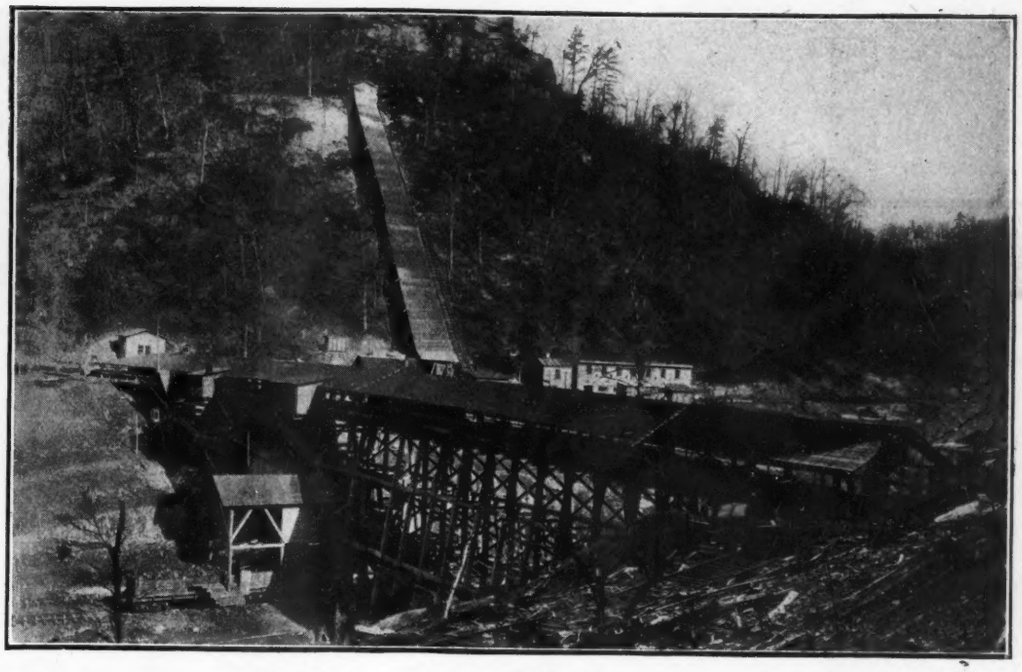


FIG. 4

Surface Works at Staub, Ky.

Plant of the Hazard-Jellico Coal Co. on First Creek. No. 6 seam, which is at tipple height, is mined on both sides of the valley, the coal being brought in cars to dumps near the center of the tipple. The chute and supply track in the rear-ground and to the right of the tipple descend from the level of No. 8 seam. This bed is of minable thickness in the high hills of Lotts Creek and Carrs Fork. The two seams are about 150 ft. apart.

bed is at its best, its thickest manifestation being on the stream first mentioned.

The seam varies in character as much as it does in thickness, being different at nearly every operation. It has a persistent bone parting from 1 to 3 in. thick and located from 3 to 15 in. from the bottom, being thickest where the seam is thick. In certain localities other partings of bone come and go but do not persist over any large area.

The coal in this seam is hard and blocky and has made an excellent reputation as a domestic coal wherever it has been introduced. It will stand frequent rehandling without much deterioration. It also stocks well. A lump of this coal taken from an old country pit after it had been lying out on the ground more than six years was sawn in two and, except for the weather stains on the outside, was found to be as black, hard and solid as a piece just taken from the mine. Furthermore the lowness of its sulphur content, about 0.56 per cent, aids in reducing the danger of spontaneous combustion.

A characteristic analysis of this seam is as follows:

PROXIMATE ANALYSIS OF NO. 6 OR HAZARD, SEAM

Fixed carbon	56.32
Volatile matter	37.16
Moisture	1.92
Ash	4.60
	100.00
Sulphur	0.56
British thermal units	13,823

From 60 to 70 ft. above the No. 6 seam is the No. 7, or Flagg, seam, averaging 52 in. in thickness with a 1-in. bone parting about 15 in. from the bottom. Though this parting is high in ash it is combustible. It is now thrown out in the shipment of the coal, but under normal market conditions it has been accepted by the trade without complaint.

The No. 6 and No. 7 seams are quite similar in character, and the fact that the two seams are seldom found workable in the same locality has led some engi-

FIG. 5

Dudley Coal Co.'s Plant

No. 1 headhouse with tipple for Mines Nos. 1 and 2. This mine is located at Blackey, Letcher County, Ky., at the mouth of Rockhouse Creek. It will be noted that it also has a steel tube for letting the coal down the hill. The road up the hill to the right of the illustration is the supply track. The tipple crosses the creek and serves the coal areas on either side.

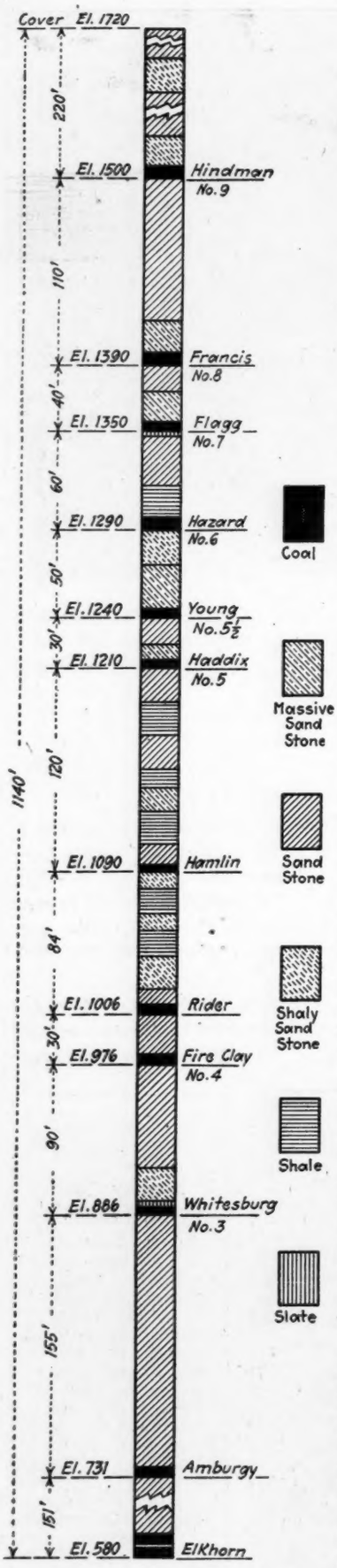


FIG. 6—HAZARD SERIES

The principal beds are No. 6 and No. 4, the "Hazard" and the "Fireclay" seams respectively.

neers to believe that they are the same seam. However, insufficient investigation has been given to the matter to determine finally which view accords with the fact. As the two are only 60 ft. apart and as local dips and rolls make their levels inconsistent in any given direction, it is easy to account for the belief that the two seams are identical. It is still possible that the assumption is justified. There is another seam of coal above the No. 6 seam on both First Creek and Lotts Creek. The thickness of this bed varies from 40 to 60 in. but it is so split up by numerous partings as to render it unminable. At Harveyton, on First Creek, and at Domino, on the North Fork of the Kentucky River, this seam has the cross-section shown in a table in the succeeding column. At Lothair and Glomawr, where seam No. 7 is workable, a bed of coal lies about the same distance above that seam as in First Creek and Lotts Creek. It has about the same characteristics as seam No. 8. At these points also a seam appears with about the same interval below seam No. 7 as is found between that bed and No. 5A on First and Lotts creeks although neither of these two seams has been sufficiently prospected to determine definitely their nature and sections. About 150 ft. above the No. 6 seam is the No. 8 seam. This is of minable thickness only in the high hills on Lotts Creek and Carrs Fork. On Lotts Creek its thickness ranges from 50 in. to 6 ft. It has

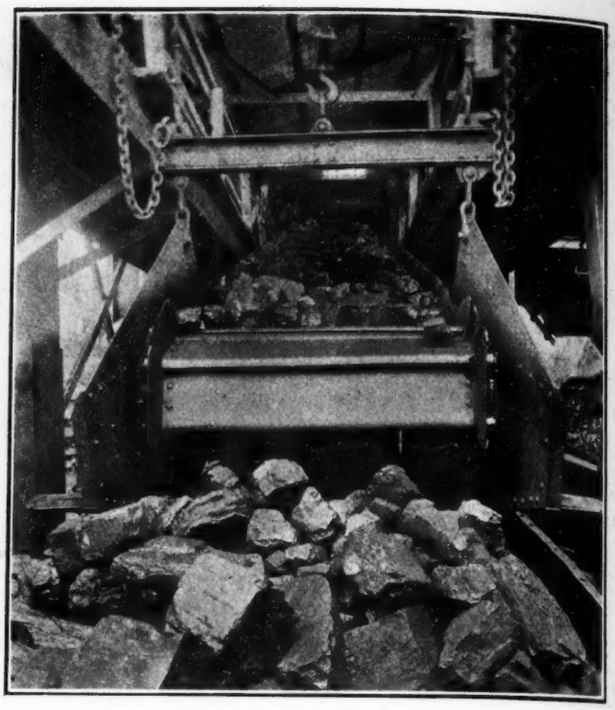


FIG. 7—LOADING BOOM, FIRST CREEK COAL CO.

A sample of the coal from the seam shown in Fig. 3 after it has been broken up and the fines screened out. The ability of the coal to withstand hard usage is quite evident.

been worked by the Hardy-Burlingham Mining Co. for the last three years. At this company's mines the seam is about 6 ft. thick. It also is operated by the Wisconsin

CROSS-SECTION OF SEAM ABOVE NO. 7 BED

Harveyton		Domino	
Strata	Inches	*Strata*	Inches
Sandstone		Sandstone	
Coal streaked with mother coal	3	Drawslate	5
Slate	3	Coal	2
Coal	16	Bone	2
Blue slate	2	Coal	9
Coal	7	Slate	10
Blue slate	2	Coal	20
Coal and rash	11		
		Total excluding slate	43
Total	44		

Coal Corporation and the Knott Coal Corporation on Yellow Creek of Carrs Fork. At these mines the coal is 6 to 8 ft. thick and practically free from binders.

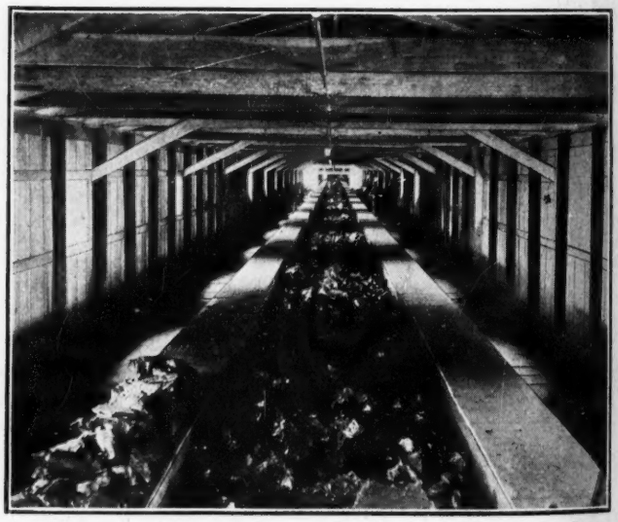


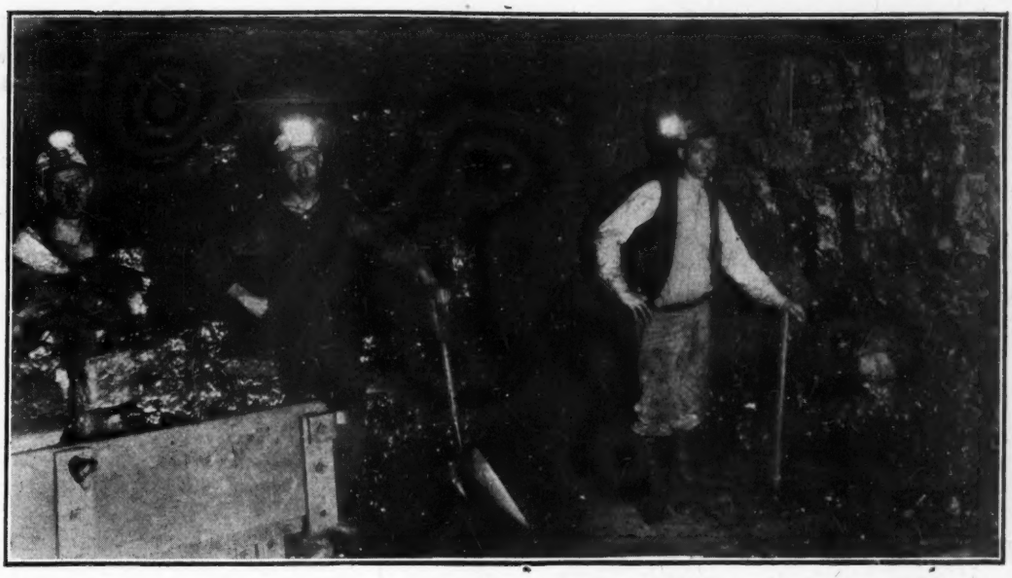
FIG. 8—COMBINED CONVEYOR AND PICKING TABLE

This is in operation at the mine of the Dudley Coal Co. Some of the refuse can be seen in the foreground.

FIG. 9

No. 4 Seam at Caudills Branch

This bed shows two characteristics that differentiate it from seam No. 6 in Fig. 3. The roof is as smooth as if polished, and the well-known "jackrock" shows at about pick-handle length above the floor. This "jackrock" is a persistent parting measuring from 3 to 6 in. and is of flint clay. Scene is from the Dudley Coal Co.'s operation, David, near Blackey, Ky.



The development of the Hazard field has been rapid. The first coal was shipped from the village of Hazard and was mined from the No. 4 seam. This was in the autumn of 1912. In 1919 the tonnage had risen to 2,400,000, and during the month of June, 1922, shipment was made of 686,500 tons of coal by the mines having railroad connections. This output would be equivalent to 8,238,000 tons annually. There are now some eighty different operations, exclusive of wagon mines, ranging in capacity from 3 to 60 cars per day.

Most of these mines have modern and up-to-date equipment, both inside the mine and above ground, for cutting, loading and cleaning the coal. They are equipped with retarding conveyors, shaking screens, picking tables and loading booms and are prepared to turn out a first-class product.

The mines are all electrically equipped and power is being supplied by the Kentucky & West Virginia Power Co., located at Lothair, which is about in the center of one side of the field. This company has had to enlarge the capacity of its plant several times since its installation but as a rule has anticipated its needs so as to give comparatively litttle trouble to its consumers. The present capacity of the local plant is 16,000 kw. It is planned to couple this plant with those at Logan and Williamson, in West Virginia, in such a manner as to make practically one plant of the three units so that in case of a breakdown at any one of the plants another can be thrown into the circuit until the trouble is corrected.

The field was aided in its development by the fact that most of the area is owned by land companies and leased to operators on a royalty basis. This enables the small financier to start his mine with only sufficient capital to put up the plant. The lessors also have assisted in financing the construction of the railroad spurs up the main creek, the operator, of course, putting in the sidetrack for his own mine.

Among the largest of these companies is the Kentucky River Coal Corporation, which owns about 140,000 acres of land in Perry and adjoining counties. This company has been particularly aggressive in advertising

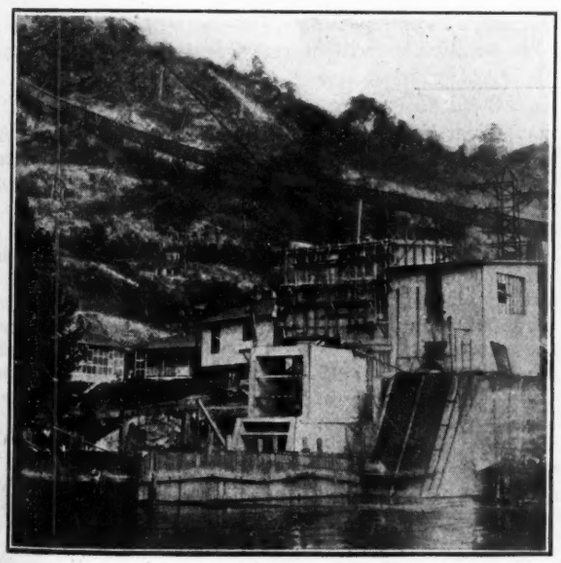


FIG. 10—PUMP STATION, KENTUCKY RIVER POWER CO.

The long conveyor of the Algoma Mine, of the Algoma Block Coal Co., can be seen in the rearground. This station is at Lothair, Perry County, Ky., and was under construction when photographed.

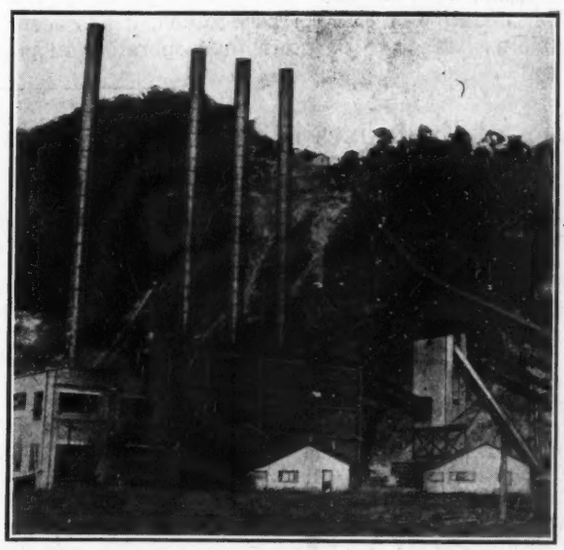


FIG. 11—POWER HOUSE OF THE KENTUCKY-WEST VIRGINIA POWER CO., LOTHAIR, KY.

Here also may be seen the conveyor of the Algoma Mine. Power plant has four alternators of 20,000 kva. total capacity, generating 3-phase 60-cycle current at 2,300 volts. This is stepped up to 11,000 volts. The boiler horsepower is 2,500.

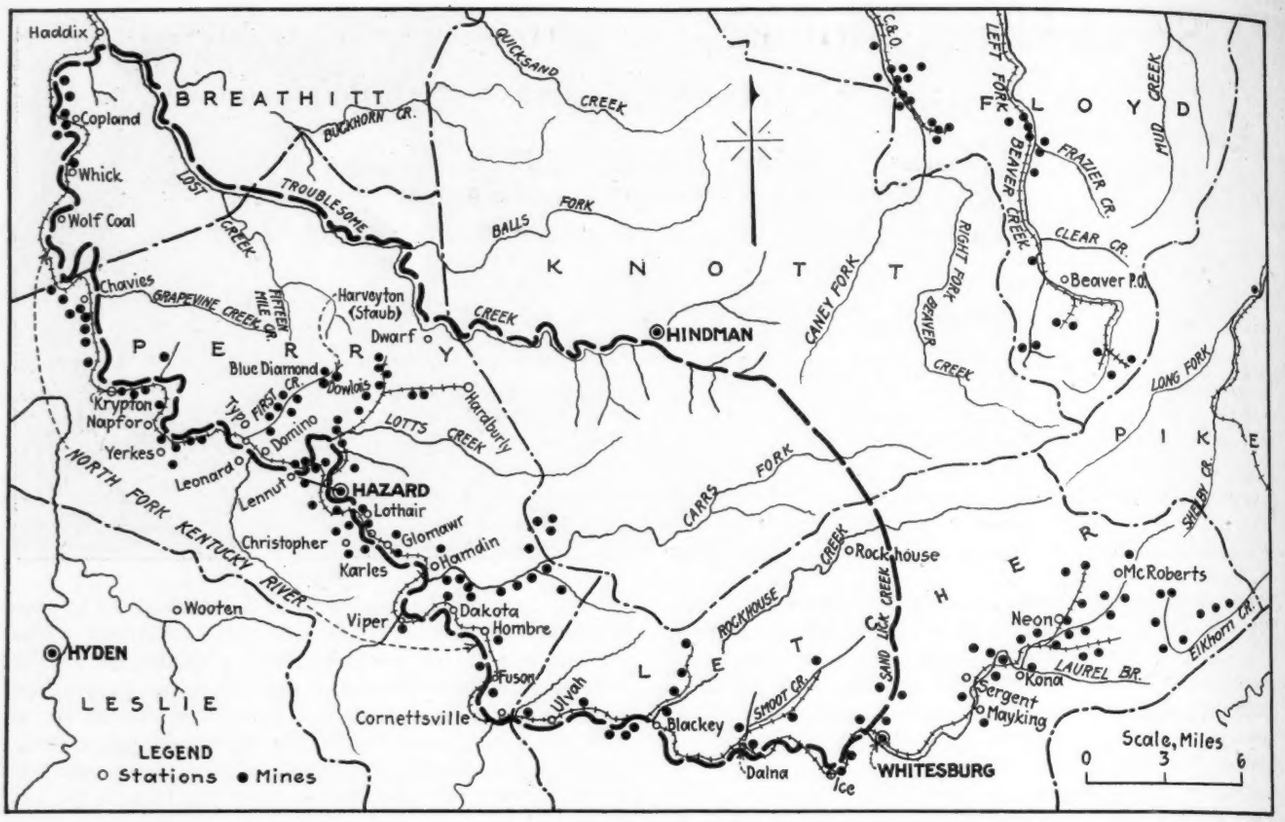


FIG. 12—HAZARD COAL FIELD LYING TO THE NORTH OF KENTUCKY RIVER FROM WHITESBURG TO HADDIX
The field lies in Perry Knott, Letcher and Breathitt Counties, in Kentucky. It has been attacked from the Kentucky River and from the affluents of that river south of Haddix. No railroad has been constructed up Lost and Troublesome Creeks, which bound the coal area to the north. The map extends into the Floyd County, or Paintsville, and the Elkhorn fields, without however, recording their boundaries.

the qualities of the coal and in bringing in outside capital, and as a result of this policy thirty-three of the operations are on the land of that company and about 60 per cent of all the coal shipped from the Hazard field is from these operations.

This company also maintains an engineering and inspection department and though the primary object of this force is to see that the coal is so mined from the company's leased land as to recover the greatest possible quantity of coal per acre mined, it has been of valuable assistance to the individual operators in planning with them the system that will be best suited to the conditions found at their mines.

As soon as the operators recognized the fact that this department was to be conducted on a policy of helpfulness as well as of criticism they gladly co-operated with it, and, as a result, the mines will compare favorably with any like group of operations in the country.

The town of Hazard also has shared in the rapid growth of the field. Starting in 1912 from a little village of 500 people, it is now a flourishing city of 8,000 population with paved streets and good schools.

Sales of Explosives in 1922 16 per Cent Greater Than in Preceding Year

Sales of explosives in the United States during the calendar year 1922 was greater by more than 16 per cent than the amount sold in 1921, according to reports received by the Bureau of Mines, which show that the total sales amounted to 431,772,077 lb. as compared with 372,107,503 lb. the year before. Of the total amount sold 178,866,225 lb. was black blasting powder, 209,476,084 lb. high explosives other than permissible explosives, and 43,429,768 lb. permissible explosives.

In 1922 the coal mines used 6,190,478 kegs, or 154,761,950 lb. of black powder, as compared with 5,613,435 kegs, or 140,335,875 lb. in 1921. In 1922 the coal mines used 25,497,758 lb. of high explosives other than permissibles, as against 34,231,542 lb. used in 1921. The coal-mining industry in 1922 used 43,429,768 lb. of permissible explosives compared with 38,055,650 lb. of permissibles used in 1921.

Pennsylvania, as usual, was by far the leading state in the consumption of explosives, having used 18,669,539 lb. of permissible explosives, 31,509,040 lb. of high explosives other than permissible, and 1,169,690 kegs of black blasting powder. West Virginia was second in the use of permissible explosives, with a consumption of 8,552,719 lb.; Alabama was third, with 4,292,969; and Illinois was fourth, with 2,758,300 lb.

Sales of explosives during January, 1923, amounted to 816,693 kegs of black powder, 5,376,370 lb. of permissible explosives, and 16,425,242 lb. of other high explosives.

Sales of black blasting powder in January were 61 per cent more than in January, 1922 and 69 per cent in excess of January, 1921, but were 9 per cent below the sales recorded for January, 1920. Of the quantity of black powder sold in January of the current year, 91.7 per cent was for coal mining.

Sales of permissibles in January were 92 per cent in excess of those for January, 1922, 36 per cent more than in January, 1921, and 20 per cent more than in January, 1920. Of the total quantity of permissibles sold in January, 1923, 94.2 per cent was for coal mining.

The January, 1923, sales of high explosives represent an increase of 47 per cent over January, 1922, 40 per cent over January, 1921, and 6 per cent over January, 1920. Coal mining operations used 19.4 per cent of this class of explosives sold in January, 1923.

Synchronous Motor-Generator Sets May Supplant Rotary Converters for Coal Mines

Comparison of Relative Stability of Both Machines—Ease of Installation and Method of Control—Ability to Correct Lagging Power—Factor an Important Economic Question

By Edgar J. Gealy
Electrical Engineer; Associate Editor, *Coal Age*

FOR evidence of the fact that the question as to whether the synchronous converter, more popularly called rotary converter, or the synchronous motor-generator set is the best machine for use about the coal mines for converting alternating current to direct current one need only make a short survey through the power plants and substations of the coal field or go over the numerous orders recently placed for such equipment. After such a survey one would find that few companies have all synchronous converters and no synchronous motor-generator sets or vice versa, indeed he probably would find at the same operation both synchronous converters and synchronous motor-generator sets and no doubt would find both types of machines among the new equipment being installed.

The latest development in substations is the automatic substation and even here we find both synchronous converters and synchronous motor-generator sets. Since these automatic substations generally are completely engineered by the manufacturer we are almost forced to believe that the manufacturer himself has this big question: namely, synchronous converters versus synchronous motor-generator sets, in his mind.

Advantages of the Two Types of Machine

For the synchronous converter almost anyone will argue as advantages such points as high efficiency, one armature winding, small size for a given capacity where its transformers may be mounted outside a building and availability of a neutral connection for the direct-current end for use in charging storage battery locomotives, thus effecting great economy compared with charging direct from the trolley line.

However, from advantages inherent in the machine itself and the trend of developments about the coal fields from the viewpoint of location of substation, kind of load, more extensive application of induction motors, tendencies toward changes in power contracts, etc., the synchronous motor-generator set seems to be the best type of machine for converting alternating current to direct current.

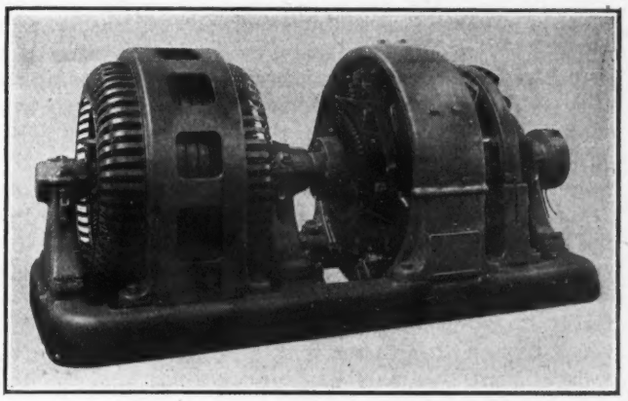
Without attempting an exhaustive comparison between these two types of machines it would be interesting no doubt to list and look into a few of the advantages and disadvantages of both types of machines.

It is a recognized fact that the synchronous converter is less stable in operation than a synchronous motor. Slight changes in the control or methods of operation of the synchronous converter rather easily upset the balance of the machine and may cause serious operating conditions. The construction of the armature is more complicated than either a direct-current armature or an alternating-current motor rotor or exciting field. The additional connections to the winding of the converter armature are both difficult to bring out and usually far from easy to repair. No matter in which direction the ventilation of the converter armature is designed carbon or metallic dust is sure to get into the winding, where it easily lodges and is not readily removed. Owing to this condition, blowing air into either end of the winding probably will more tightly lodge dust and dirt into one end or the other.

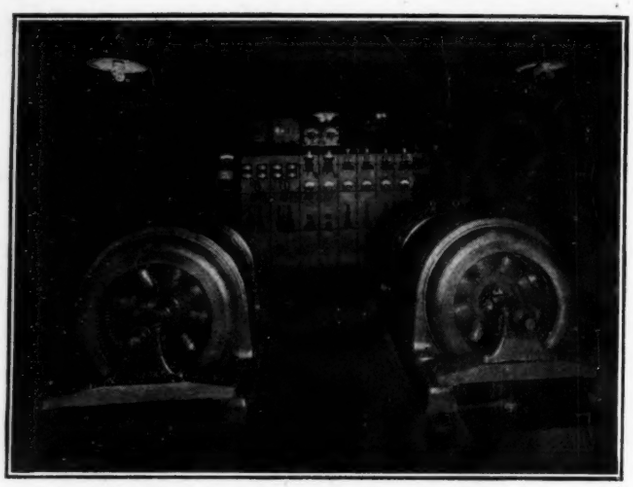
Greater care in starting a converter also is important. Depending upon the type, it usually is necessary either to raise the brushes or break up the field in starting. Then, again, the converter may build up in the wrong direction, thus requiring a re-start or a shift of a pole. The double-throw knife-blade switch used for starting the converter and putting it on full voltage always has been a source of danger both in starting and when running. Furthermore, occasions have been known where this switch has been accidentally opened under load in an attempt to take the converter off the line. In such cases the result was especially dangerous to the operator and equipment.

All these difficulties either do not exist with starting a synchronous motor or are far less dangerous. The starting switch of the synchronous motor invariably is an oil switch and can easily be arranged so that the operator need not come anywhere near any live parts.

Another point of advantage that the synchronous motor-generator set has is the fact that it is, as the name implies, a motor and a generator. Both these machines are popular all through the mining properties and therefore are pretty well understood by almost every electrician and electrician's helper. For this reason they will attack a breakdown job on the motor-generator set with far more confidence than they would have in attempting to repair a synchronous converter. This feeling is also borne out all through the life of the



A TYPICAL MOTOR-GENERATOR SET
This machine has become very popular in the coal field, as it readily lends itself to either manual or automatic operation and control. It may be easily knocked down for transportation through the mines to remote places.



AN INSIDE SUBSTATION OF INTEREST

These motor-generator sets were so designed as to be readily accessible in case of breakdown. This is important where equipment has been installed at a point in the mines far distant from the repair shop. The control of this station is not automatic as it is in some of the more recent installations.

machine, as it is quite noticeable that synchronous converter substations are more frequently shunned on inspection trips and whenever tests are to be made to determine the condition of equipment.

Two of the most important factors which determine the location of converting equipment at a coal mine are center of the load and accessibility. Frequently these factors demand that the converting equipment be in places where it is inconvenient to locate step-down transformers for a synchronous converter and also entailing expense, danger and inconvenience in case of a breakdown. Here the synchronous motor-generator set seems to fit in well. The high-tension voltage for the motor in most cases may be taken direct from the supply lines without the use of transformers and even where transformers are required, it seldom matters a great deal where they are placed with respect to the location of the motor-generator set. They may even be of sufficient size and be so located as to carry other loads whenever they are required.

When located inside the mine or in a place not readily accessible the synchronous motor-generator set may be housed in a small space and presents less difficulty in setting up than the synchronous converter with its transformers. Where an automatic substation is to be set up it has appeared that the starting and stopping could more readily be controlled from a remote place when a synchronous motor-generator set rather than when a synchronous converter is used, this being particularly true where the machine is installed inside the mine and the control equipment is for the most part outside the mine in a separate control house.

The load on the converting equipment of a coal mine usually consists, in the main, of haulage machines—generally locomotives and hoist. The very nature of the work of these machines makes the load on the converting equipment very irregular. At times these irregularities become extremely severe and sudden, as, for instance, when an attempt is made to start a very heavy trip or to replace a trip of cars on the track after a derailment. On this kind of irregular load the synchronous converter sometimes gives trouble by flashing and burning the commutator and brush rigging. The machine is liable to hunt and become dangerous. The difficulties which arise, if at all, with a synchronous motor-generator set under these same conditions are far less pronounced.

A greater appreciation of the advantages of the induction motor in coal mining, due to its rugged construction and lack of the troublesome commutator will gradually become more generally realized. With this greater appreciation of the induction motor will come the realization of the flexibility of alternating current and the advantages of higher voltages for transmission and distribution systems.

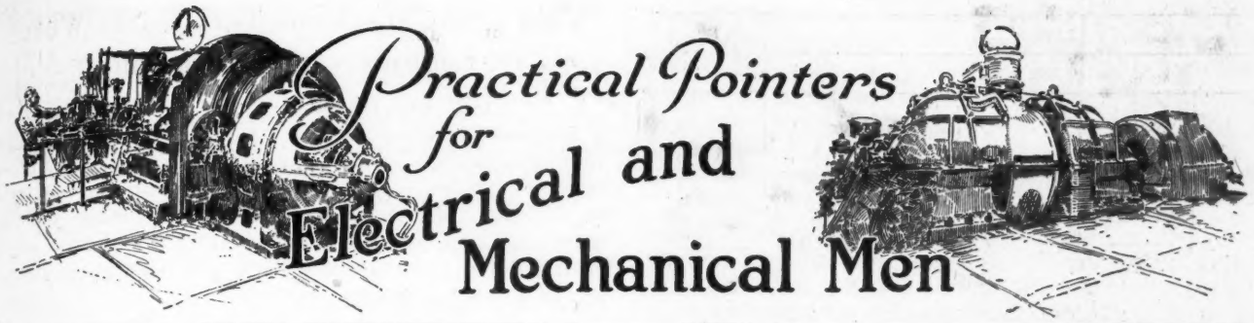
The increased application of the induction motor necessarily brings about a condition whereby the large inductive loads produce a lagging power factor which may become important if the induction motors are applied to a large percentage of varying loads or to loads that are highly overmotored. The excessive lagging current thus produced may become very troublesome, necessitating larger distribution wires, larger transformers and larger generators. Fortunately, this condition of lagging power factor due to the high inductive load produced by the induction motors can be corrected at the coal mine.

Here the synchronous motor-generator set again has a definite advantage over the synchronous converter. The synchronous converter can help the situation to some degree but cannot be called upon to materially correct poor power factor, while the synchronous motor may be called upon to partly correct the poor power factor of the system. With a slightly increased capacity in the synchronous motor over that required for the direct-current load, considerable correction can be made with little difficulty, thus bringing the power factor to a very reasonable operating value.

Consumer to Blame for High Power Bills

Many of the complaints against the power companies by purchasers of power are unjustifiable, because in a great measure they are due to some condition arising from the fact that the consumer has not used good judgment in the selection of his equipment. Many of the grievances complained of could be best remedied not by the power company but by the consumer himself, as most of them are in some way connected with poor power factor. They may be in the form of a complaint about low voltage, poor voltage regulation, fuses opening the lines frequently, circuit-breakers tripping, overheated motors, high magnetizing current in equipment, low torque from motors, high equipment costs, high kva. capacities required throughout the system. After all, the installation of a synchronous motor generator set is one of the best remedies for these difficulties.

With greater demands upon the central stations for more power it is natural to find a continual revision of power schedules by the power companies. The greatest changes in these schedules, although not always immediately enforced, are with reference to penalties for low power-factor loads. Some of these penalties are no doubt unjustifiable, in some cases, because they charge the consumer for out-of-phase kva. at the same rate as for true power, yet properly arranged penalties for poor power factor are justifiable. The conditions which the consumer is apt to complain about are based upon facts which he himself would have to meet if he were making his own power; therefore it behooves the consumer to operate his equipment to the best advantage lest he be penalized for conditions which would handicap his own generating plant if he were making his own power.



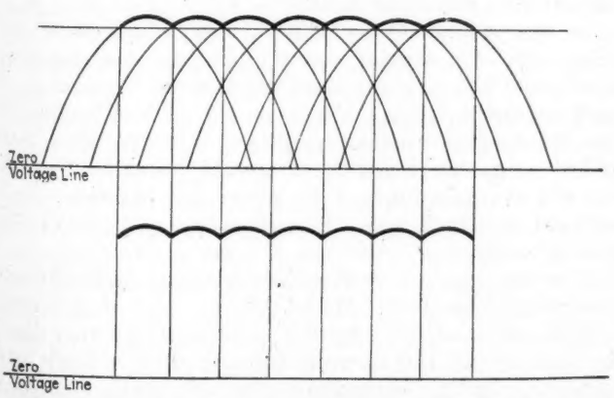
Function of and Operation of the Series Field of a Rotary Converter

WILL you be kind enough to explain in your columns the function of the series field on a rotary converter? I understand that on a compound generator the increased load acts to raise the voltage by the increased field established by the series field current. From what I have read about rotary converters this does not seem to be the same case, although the winding is called the same, is located the same and carries the load current in the same manner.

J. R.

It is true that the series field winding on a rotary converter is located the same as on a compound generator. With certain modifications it also does the same work as the series field of a compound generator. However, to best understand the rotary converter we must first of all remember that the ratio between the alternating-current voltage and the direct-current voltage is fixed. The rotary converter in its simplest terms is a machine which takes a given alternating current voltage and picks off the tops of the rapid succession of alternating-current waves and ties them all together and forms a direct-current voltage—in other words, the rotary converter is a commutating machine. In this way we see that if we start off with a low alternating-current voltage this means that the potential of the peaks of these waves is low and when these low peaks are picked off and combined to form a direct-current voltage, then the resulting direct-current voltage must be low.

Questions calling for special treatment constantly come to electrical and mechanical men at coal mines. These cover equipment and materials for special needs. Every time you find a solution for one of your problems, send it to "Coal Age" and thus pass it along to others. Send your questions in too.



CONVERTING ALTERNATING TO DIRECT CURRENT

The upper section shows the upper halves of a series of alternating-current waves. The heavy section shows the part commutated. The lower section represents the resulting direct-current voltage. Note that the closer the alternating-current waves the less pronounced become the ripples in the direct-current voltage.

When the load comes on the direct-current end of a rotary converter this same load, of course, is transmitted back to the alternating-current end and upon the alternating-current supply. When this happens certain conditions arise in the alternating-current system which reduced the alternating-current voltage. Consequently, since there is a definite ratio between the alternating-current voltage and the direct-current voltage, the direct-current voltage from the rotary drops with the alternating-current voltage.

The series field, however, functions under these conditions and causes an effect in the alternating-current system to neutralize the cause of the drop in alternating-current voltage. By thus maintaining the alternating-current voltage the series field indirectly maintains the direct-current voltage. In some cases it may even raise the direct-current voltage, but whatever it may be, in this event, it cannot be a great deal.

The Delta Connection Made Clear

METHODS of connections used with alternating current are sometimes confusing. Many times the connection cannot be definitely ascertained until a close inspection has been made. In three-phase work the general plans of connecting equipment resolve into three general types. One of the most common connections is termed the "delta."

As with all equipment used on electrical circuits it is important to make every connection and each part of a general connection correctly. Strange as it may seem, I have known some very good electricians and electrical helpers who lacked a very clear conception of the delta connection; in fact, some of these men could correctly connect up a bank of transformers in delta and yet were completely lost in connecting three coils, say, on a tripping device, in delta.

The important point to bear in mind when making a delta connection is that each coil involved in the delta connection should be suitable in voltage rating for connection directly across the voltage of the line. For example, a transformer winding or motor winding to be connected in delta with two other similar windings should have the same voltage rating as that measured across any two wires of the line. From this

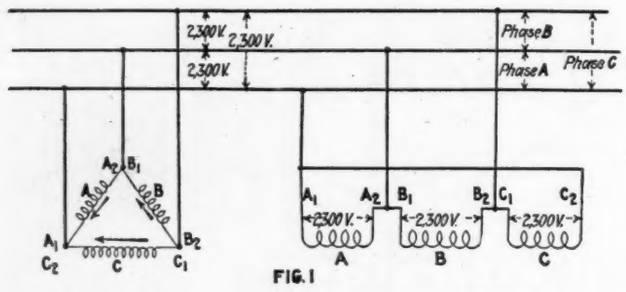


FIG. 1—COIL ARRANGEMENT IN THE DELTA

Each of the three coils is across a phase of the three-phase system and therefore must have the same nominal voltage rating as the line voltage.

we see clearly that the 2,300-volt winding of a transformer may be connected in delta with two other similar transformers to a three-phase 2,300-volt alternating-current line.

The accompanying diagram shows both a schematic delta connection and the usual arrangement of the delta connection applying to transformers or any other group of coils having the same voltage rating as the line—for example, the coils of an induction motor.

In Fig. 1 the arrangement appears as if the different windings were short-circuited, but this is not the case, as the phase differences or times of impulses of the various three-phase voltages prevent such a thing when the connections are properly made. When the voltages on any two coils or windings are in the same direction around the triangle formed by the delta connection, the voltage of the third one is always opposed to them and equal to the instantaneous sum of the two.

This is rendered quite obvious by Fig. 2. At a given instant of time called TT_1, both phase *A* and *B* are positive in the amount represented by the distance *E*. These two values of voltage, since they are in the same direction, may be directly added together and give a total amounting to $2E$.

Again looking at Fig. 2 we notice that at this same instant phase *C* is working in the opposite direction, represented by a value $2E$, which balances the sum of the voltages of phases *A* and *B*. In Fig. 1 the voltage arrows again bring out this point. It will be noticed that the arrow at coil *C* is twice that at coils *A* and *B* and opposite in direction, thus maintaining the balance. In this way the balance always is maintained between the values of the voltages at any one instant.

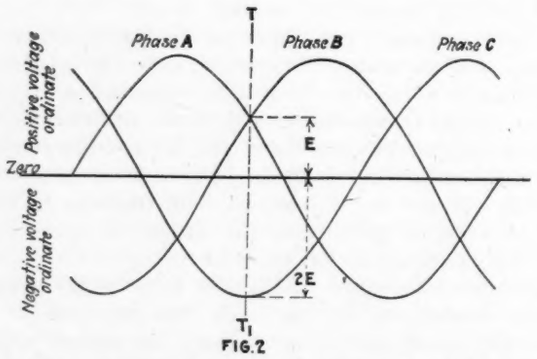


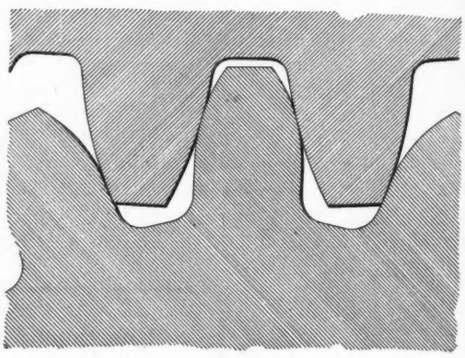
FIG. 2—PHASE VOLTAGES ALWAYS BALANCE

Drawing a line parallel to TT_1 will show that at any instant the voltages balance. Care should be taken to consider both the direction and value of all the instantaneous voltages. At the instant shown voltage of phase A is positive E, phase B is positive E and phase C is negative 2E which balances E + E of phases A and B.

What Is the Maximum Permissible Wear Of Locomotive Motor Bearings?

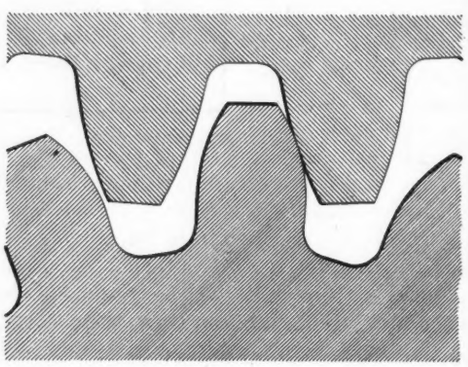
A SERIOUS evil frequently allowed to exist on mine locomotives is excessive wear of the armature and back-axle linings. This is one of the causes that tend most to shorten the life of gears and pinions as well as to cause expensive delays. If maximum life is expected from gears and pinions the maximum wear limits of the armature and back-axle linings should be set at a predetermined limit.

For 3- and 2½-pitch gears it is good practice to set the maximum limits at $\frac{1}{16}$ in. for the armature lining and $\frac{1}{8}$ in. for the back-axle lining; for smaller teeth these limits should be reduced.



PROPERLY MESHED GEAR AND PINION

This insures smooth, easy and quiet running; no breaking of teeth and no pounding out of bearings.



GEAR AND PINION IMPROPERLY MESHED

This shows the condition when the shaft centers are $\frac{3}{16}$ in. too great. Note that the top of the tooth is doing the work and the large back lash.

In the accompanying illustrations, which show the exact size of a popular new 3-pitch gear and pinion in mesh, one shows the correct mesh when the armature and back-axle linings are in perfect condition, while the other depicts actual conditions with the same new gear and pinion when the armature lining is worn $\frac{1}{16}$ in. and the axle lining $\frac{1}{8}$ in. Note the improper mesh and extreme back lash. This causes noise, broken teeth and a surprising reduction in life.

For checking the wear of the linings a tapered gage can readily be made. If the axle is enclosed in a dust guard which is not provided with an inspection door, by jacking up the bearing housing with a block and pinch bar, a fair estimate of the axle lining wear can be made without removing the guard.

New gears are expensive, especially when the cost of taking the old gear off and putting the new gear on is allowed for.

Book Reviews

Carbon-Dioxide and Methane Outbursts in Coal Region of the Gard, France

By F. C. Cornet

APPOINTED in 1913 by the Southeastern Branch of the "Société de l'Industrie Minérale (Mineral Industry Society), of France, to investigate and report on the outbursts of methane and carbon dioxide occurring so frequently in the mines of the Gard coal field, in central France, the Commission des dégagements instantanés (Gas outbursts commission) has just made its report in a paper-covered volume of 40 pages 8¼ x 10⅝ in.

The Gard coal field is small, its area being less than 200 square miles, but no more disturbed area could well be imagined, the seams pitching at all possible angles and in all directions of the compass. These geological conditions are worst in the southeastern half of the field, where practically all the outbursts have been of carbon dioxide. In the northwestern section of the field, where methane outbursts happen quite frequently, carbon dioxide seldom is found in any troublesome quantity.

Though the seams mined in the northwest are obviously not the same as those mined in the southeast, it is still a question which group of seams is the lower geologically. The first outburst, one of methane, occurred in the northwest area in 1879. Since then, if the field be considered as a whole, more than 1,600 blowouts have been recorded, 1,100 of which are of carbon dioxide. Only a few of the outbursts have discharged a mixture of that gas with methane.

Most Violent Gas Is the Carbon Dioxide

The most violent, by far of the outbursts always have been those of carbon dioxide. Some of the latter have occurred under a cover as light as 400 ft., and, it may be added, no mine in the field is more than 1,000 ft. below the surface. In not a single instance has the opening created by a blowout been large enough to account for more than a fraction of the fine coal and slate thrown out by the manifestation.

Boreholes as advance detectors of danger have proved as illusory as they do in every other place where blowouts occur. Methane blowouts happen only in soft and easily mined seams—that is, in coals which have sustained in past geologic ages such crushing as to deprive them of their cohesion. Blowouts of carbon dioxide generally occur in hard seams the appearance of which little indicates the terrific upheavals to which they have been subjected in the past.

All outbursts, both of carbon dioxide and methane, are preceded by underground thunder, crushing of timbers, wind blasts and dust clouds. The notice of danger thus given may be of a few seconds only, but the premonitory signs sometimes will last hours and have been known to continue intermittently through several days. The longer the warning, the less violent the outburst.

It often has been remarked that shortly before a blowout of carbon dioxide occurs the face becomes appreciably colder than the atmosphere of the workings, especially if the seam be damp. Some of the worst blowouts happen when a seam is reached by a *bouveau*, which the French call a *travers-banc*, or by a shaft or is on the point of being reached by either one.

In a preceding article* has been described the method by which the Gard operators provoke blowouts by so-called "jarring blasts." This method is adopted in shaft sinking, in *travers-banc* driving and in regular mining work. When pillars of comparatively small area have been left standing for a sufficiently long time, however, they sometimes may be recovered without resorting to the jarring blast.

In the case of carbon dioxide a pillar is a long time being purged of its gas. A methane blowout will free the coal of its gaseous contents for some distance ahead, and the seam in consequence, must be penetrated a little further before another such blowout will occur. But one blowout of carbon dioxide, on the other hand, may follow immediately after another—that is, two consecutive jarring blasts may each cause a blowout at the same face.

The commission's report devotes several pages to the rules followed or recommended in connection with jarring blasts. It is urged that all such blasts be fired from the outside exclusively. On account of its high specific gravity, the carbon dioxide after a blowout will fill the mine down to its lowest levels unless prevented from so doing by a strong and voluminous air current. In many instances the gas has reached the surface through both the downcast and the upcast at the same time. It has been known thus to asphyxiate the men working at the top of the hoisting shaft.

In at least one instance, at night, a carbon-dioxide outburst carried up the hoisting shaft a quantity of fine coal and dirt sufficiently large to block a public road, the gas spreading at the same time into houses situated more than a thousand feet away and asphyxiating men, women and children in their beds, some on the second floor of the houses they occupied. The report says nothing concerning the probable causes of either the carbon-dioxide or the methane blowouts.

*"Precautions to Guard Men from Seam Outbursts," *Coal Age*, March 8, 1923, pp. 408-411.

Desulphurization of Coke by Steam

IN THE course of laboratory experiments in the desulphurization of coke by steam being conducted by the Department of the Interior at the Pittsburgh experiment station of the Bureau of Mines, steam tests at atmospheric pressure for the removal of sulphur from lump coke have been finished. In Ohio the combined sulphur as FeS, $FeSO_4$ and free sulphur (not including that in solid solution) was reduced from 1.38 to 0.72 per cent. The solid-solution sulphur was not affected, but it has been shown that this has little effect in contaminating the sponge iron in the blast furnace. In Illinois coke 0.62 per cent sulphur correspondingly was reduced to 0.48. Clairton coke, which is low in sulphur, was reduced from 0.29 to 0.17 per cent. Sulphur in a sample of gas-house coke from Philadelphia was reduced from 0.81 per cent to 0.60. These results were obtained without the application of a vacuum, in the presence of which it may be possible still further to reduce the percentage of sulphur. Little steam is required.

Problems of Operating Men

Edited by James T. Beard

Blame for Explosions in Mines

Analyzing the Situation—The Company, the Superintendent, the Mine Manager—Chief Fault in the Employment of Incapable Men

FOR some time past, it has been a common thing, on picking up a newspaper, to read the account of another mine disaster with the loss of a hundred or more lives. The question naturally comes home to all of us as to where the blame for these dread occurrences should rest.

To reach a more intelligent conclusion in answer to this question, let us analyze the situation in respect to the men who are personally responsible for the management of our mines. These men, in the order of their responsibility, are the mine owners or management, the superintendent employed by the company and the mine manager (mine foreman).

Now, I know of no mine owners or of any management of mines who are indifferent to the possible occurrence of a disaster in one of their mines. If for no other reason than the great loss of life involved they naturally do all in their power to avoid such an occurrence in their mines.

In all my experience in coal mining, I have observed an almost lavish expenditure of money to provide the necessary machinery and other appliances for the adequate ventilation of the mines and making them safe for work. It is foolish to think that these expenditures would be withheld where money is needed for the safe operation of a mine.

It is not in this respect that companies commonly fail in their responsibility for safety. On the other hand, however, it frequently happens that a company will employ a superintendent who is not a practical man in respect to knowing what is needed underground to properly safeguard the work. The employment of such a man as superintendent will always prove a handicap to a practical mine manager (foreman).

Must Obey Orders of His Superintendent

In the operation of a mine, the mine manager is naturally subject to the orders of the mine superintendent who holds the higher office. For this reason, it is all the more important that the man who occupies the position of mine superintendent should have a practical as well as a theoretical knowledge of the mining of coal, and be fully acquainted with the conditions existing in the mine, through his own personal experience underground.

Turning now to the mine manager or foreman, who is in direct charge of the work performed in the mine, any lack of practical knowledge and experience on his part or failure to properly perform his duties may cost him his own life and sacrifice the lives of the men in his charge, as was the case in the last two explosions, at Dawson, New Mexico, where all in the mine were killed in each explosion.

To the practical miner, these happenings are not mysterious. It is hard to make him believe that a single unauthorized shot was the cause of the explosion in a mine classed as a non-gaseous mine. His invariable conclusion would be that gas had accumulated at some point in the old workings, or in some poorly ventilated place that had been driven ahead of the air and stopped.

The practical miner is prone to believe that some fellow, ignorant of his danger, walked into such a place with an open light on his head, or smoking a pipe, and set off the gas that has escaped the notice of the fireboss when making his morning examination of the mine.

In such an instance, the responsibility for the disaster is attributed to the failure of the mine examiner (fireboss) to properly perform his duties in the mine. It is true that, in many cases, it can be shown the territory was too large to permit of a careful examination, within the time allotted for that purpose, and the real responsibility for such a condition is then thrown back on the management or owners of the mine.

Allow me, in closing, to state my opinion that the chief fault, in respect to mine disasters, lies in the employment of incapable men to take charge of the work, rather than any lack of expenditure in making the mine safe. Mine disasters will continue until capable men are placed in charge of the work.

Edwardsville, Ill. DAVID YOUNG.

Clearance on Haulways

Crooked roads driven without sights cause many accidents—Capable foremen insist on all entries and rooms being driven on sights—The foreman on the job.

HAVING missed my *Coal Age*, for a short time past, it was with deep interest that I recently read numerous letters relating to mine accidents and their causes. One writer asks, "What causes so many accidents in the coal mines?"

Every person, of course, has their own way of thinking and each is guided by his own particular experience in accounting for the great number of accidents, both fatal and non-fatal. In a few words, I want to draw attention to one frequent cause of accident, for which there is little or no excuse, if the mine foreman in charge is capable and efficient.

Going into different mines, it is a common thing to observe crooked roads. Naturally, the tracklayer has not kept the track in the center of the entry; but it first brushes one rib and then the other as the entry bends from side to side. With due care on the part of the foreman in charge of the work, all of this could have been avoided.

In my experience, a large number of accidents are due to these crooked roads. There is no wide side

having a good clearance where men can walk with safety. Drivers are in constant danger of being caught between the car and the rib, at points where the track hugs one side of the entry. In many cases, the cars actually rub a post, which is in danger of being knocked out at any time.

Strange as it may seem, hardly one man in ten can keep an entry straight, even when good sights are given. Many certified foremen and assistant foremen fail in this respect. All will agree, however, that safety requires maintaining a good wide clearance continuously on one side of the entry; but this cannot be done unless the road is practically straight.

Every capable mine foreman will insist on sights being given in the driving of all rooms and entries. A foreman who is a foreman in action as well as in name, is the man who is on the job throughout the day. He does not wait for the mine inspector to tell him he must get busy and straighten his roads, slabbing the ribs at points where that is required to give the necessary clearance. Instead, the inspector finds the roads are straight and there is no cause for complaint.

The foreman who is on the job is not the man to depend on his assistants alone. He is there to see for himself. You will not find him sitting in his office when the mine is in operation; and the result of his constant watchfulness and supervision of the work is shown in the daily cost-sheet. He is not the man whom the superintendent must watch nor has he any fear of interference from that source.

Let me say, then, if accidents are to be avoided, the foreman must be on the job, work in harmony with the inspector and feel the responsibility resting on him for the safe operation of the mine, in every detail pertaining thereto.

It is a sad mistake for a mine foreman to think that, having secured his papers, he is in a position to lay down on his job. He should realize that now is the time to show what he is worth as acts go farther than words. Getting his papers does not relieve the man from continued study and reading to keep himself up to date.

JOHN H. WILEY.

Oliphant Furnace, Pa.

Economic Aspect of Mine Disasters

Foreman vainly appeals to superintendent to make mine safer—Accidents increase cost of production—Effect of compensation insurance—Mining of large coal a factor.

READING the excellent editorial entitled "Fundamentally Wrong," *Coal Age*, March 8, p. 398, found me very much in harmony with most of the assertions relating to practices, in our mines, that have a tendency to increase rather than decrease mine accidents. The editorial closes by saying, "Something will and must be done to make our mines safer."

The expression "our mines" led me to feel that the writer of the editorial, like myself, felt and was willing to assume his share of responsibility in the prevention of mine accidents. It awakened in my heart a friendly feeling, as it showed no discrimination; but recognized the obligation that rests on all of us alike to do our part, as far as lies in our power, to eliminate the numerous causes of accidents and make our mines safer.

Recently, some conditions existing in our mines, here, prompted me to request my employer to do something to lessen the hazard to life and limb. In response, I got no satisfaction and was probably thought to be radical in my ideas of safety. However that may be, I only acted according to the dictates of my conscience and in behalf of myself and others. I was speaking both from a humane and an economic standpoint.

Could our mine officials but visit the hospitals, say once each month, what they would see there might convince them that 90 per cent of the suffering and distress resulted from what can be called "avoidable accidents." The sight, I believe, would stimulate them to action for the prevention of accidents, and both they and we would be benefited.

Many operators lose sight of the fact that accidents in their mines are a liability to be covered by the operation of the mine. As we all know, however, the operator passes the burden on to the consumer, who is the ultimate sufferer and must stand the increased cost of production, which is sure to follow. The question is thus seen to be an economic one that should interest the public, at least in their own behalf aside from humane reasons.

The statement may surprise some that a number of our best mines, as far as natural conditions are concerned, make the worse showing in respect to the number of fatal and non-fatal accidents. The reason for this is to be found largely in the effect of the operation of the Compensation Law and the assumption of accident risks by the affiliated insurance companies.

Too Little Supervision of Workers in Mines

My observation leads me to suspect that, in certain cases, companies are paying less attention to the supervision of their mines, allowing the payment of liability insurance to take the place, in a measure, and render unnecessary the employment of safety inspectors. Without a doubt, this has been the direct cause of some accidents. In my opinion, while fire insurance is a great help in most cases, if there were no means of such insurance, there would be a less number of fires.

In my own mind, while admitting that workmen's compensation, as provided by law in many states, is a great benefit to the unfortunate victim of accident, the question has often arisen as to whether the law has had the tendency to reduce the number of accidents that occur in our mines, as was hoped would be the case.

The editorial writer has mentioned the practice of "topping," in the loading of mine cars, as an argument against rock dusting, which he says has not been followed extensively in this country. It must be admitted, however, there is no question but that the practice of topping mine cars has had a tendency to produce large coal in mining, which greatly lessens the dust danger in the mine.

Another incentive to the mining of large coal was lost in the adoption of the mine-run basis of payment. Previously, when lump coal was made the basis of payment, great care was taken by the miners to avoid the production of fine coal and slack, which would go through the screens and afford the miner no return. With the loss of this incentive to mine large coal, are we now to look for doing away with the practice of topping the cars in loading?

Doubtless, the topping practice has some tendency to increase the dust danger, by reason of much coal being lost in transit from the working face to the shaft bottom or the tipple. However, it seems as though there

should be another remedy to overcome that evil. In all of these matters, let us hope that good reasoning will save us, who mine the coal and the public who consume it and, incidentally, reduce the high cost of production and the number of mine accidents.

Linton, Ind. W. H. LUXTON.

Difficult Examination Question

Circulation in a shaft mine increased by adding another airway—Solution first assumes constant quantity and then constant power.

SOME time ago, I recall that the solution of a difficult examination question was asked and answered in *Coal Age* [Vol. 22, p. 1002]. Later, in the issue of March 1, p. 379, a contributor offered a solution of the same question by the equivalent-orifice method. Both of these solutions seemed to me difficult and I want to offer the following:

Briefly stated, the question assumed a circulation of 10,000 cu.ft. of air per min., in a mine ventilated by two shafts, each 6x6 ft., in section, and 500 ft. deep. The air was passing in a single current through an airway having the same section as the shafts and 1,000 ft. long, making the resistance of the airway equal to that of the two shafts combined. The question asked, How much this circulation would be increased by adding another airway of the same size as the first, the power remaining unchanged?

The solution I would suggest is the following: First, assume the quantity of air in circulation to be constant and find the relative power required in the two cases. For example, writing the formula for power (H), in terms of the rubbing surface (s) and the sectional area of the shafts or airway (a), for a given quantity of air in circulation (q), and a coefficient of friction (k),

$$H = \frac{ksq^3}{a^3}$$

But, k and q being constant, it is evident the power varies as s/a^3. Now, since the sectional area of each shaft and that of the airway is the same throughout the length of the airway is equal to the combined depths of the two shafts, it is clear that the addition of a second airway will double both the sectional area and the rubbing surface in the mine. Then, taking the area and rubbing surface of the shafts or single airway as unity or 1, since the power varies as s/a^3, we can write for the power absorbed in the shafts and airways, in each respective case as follows:

1st case,

shafts $1/1^3 = 1$; airway $1/1^3 = 1$; total 2 hp.

2nd case,

shafts $1/1^3 = 1$; airways $2/2^3 = \frac{1}{4}$; total $1\frac{1}{4}$ hp.

This shows that to pass a constant quantity of air in these two cases, the power is reduced from 2 hp. in the first case, to $1\frac{1}{4}$ hp. in the second case, or as 8:5.

Then, finally, since the quantity varies as the cube root of the power in a given airway, and calling x the required quantity in circulation in the second case when the power is increased from $1\frac{1}{4}$ to 2, or in the ratio 5:8, we have,

$$\frac{x}{10{,}000} = \sqrt[3]{\frac{8}{5}} = \sqrt[3]{1.6} = 1.1696$$

$$x = 10{,}000 \times 1.1696 = 11{,}696 \text{ cu.ft. per min.}$$

I submit this as being the simplest possible solution of such a problem. MAC.

River Herbert West, N. S.

Inquiries Of General Interest

Depth of Coal Mines in Belgium Often Exceeds 1,000 Meters

Dispute Regarding Depth of Mining Coal in Belgium—Question Referred to Expert Shows Shaft Exceeding 4,000 Ft. in Depth

RECENTLY, I had quite an argument with a mine boss in this locality regarding the depth of Belgian mines. I was speaking of the great depth of some of the coal shafts in the basin of Charleroi, in the Province of Hainaut, Belgium, where I was born.

In the conversation, I referred to one mine in particular that went by the name of "Parrent." While unable to give the exact depth of the shaft, I explained that it was very deep and had a curve, the result of being thrown out of line by changes that had taken place in the strata since the shaft was sunk.

My friend told me that no mine in Belgium lay at a depth of 1,000 yd., which I had said was exceeded in the shaft mentioned. As I have been unable to meet his challenge to prove the correctness of my assertion that there were a number of mines in Belgium having a depth greater than 1,000 yd., I decided to write to *Coal Age*, asking for corroboration of my statement.

My friend is one who is hard to convince. He is the type of man who "knows it all," and should he see the proof of my claim published in the columns of *Coal Age*, it would still be difficult for him to acknowledge that he was wrong. CHARLES TROYE.

West Terre Haute, Ind.

The question of this correspondent was referred to F. C. Cornet, a mining engineer who is thoroughly familiar with the mining of coal in Belgium, and who recently contributed an interesting article on Blowouts in Belgium Coal Seams, which appeared in *Coal Age*, March 1, p. 367. In response to our request, Mr. Cornet writes as follows:

A depth of 1,000 yd. (3,000 ft.) places a shaft in the 900-1,000-meter class, of which there are probably fifty or sixty examples in Belgium. When speaking of their mines, Belgians seldom specify the depth of the shaft, except where this exceeds 1,000 meters (3,280 ft.). For this reason, it is hard to state the exact number of shafts in Belgium belonging to the class mentioned.

Last year, there were seventeen mines whose depths varied from 1,000 to 1,100 meters (3,280-3,609 ft.). There were two mines having depths varying from 1,100 to 1,200 meters (3,609-3,937 ft.). There was one mine whose depth was 1,240 meters (4,068 ft.). To this depth must be added a 40-ft. sump to obtain the depth of sinking.

These figures show that there were twenty mines in Belgium last year worked at a depth exceeding 1,000 meters. Since the mining laws permit no mine to be operated with less than two shafts, we can certainly say there were at least forty shafts whose depths exceeded 1,000 meters.

Examination Questions Answered

Alabama Foremen's Examination, Birmingham, Jan. 22, 1923

(Selected 2nd Class Questions)

QUESTION—*A large percentage of mine accidents are caused by miners persisting in loading coal where the roof is unsafe. What rule would you adopt to prevent this condition and reduce the number of accidents?*

ANSWER—A rule strictly forbidding the loading of coal or doing other work when a miner enters his place in the morning, until he has carefully examined the roof in his place and has set any timbers that may have been dislodged by the shots of the night before, or that may be needed to make the place safe for work. This rule should be strictly enforced and any violation suitably punished.

QUESTION—*What method of ventilation lessens the danger of an explosion and at the same time reduces friction?*

ANSWER—The method known as "splitting the air current," or dividing it into two or more splits, makes it possible to distribute the air according to the need in each section of the mine. The mine is thus divided into separate ventilation districts and a local explosion occurring in one district is not so readily transmitted to another district, thus rendering the mine less liable to a general mine explosion. Again, the velocity of the air is reduced, making it less liable to transport dust and hold it in suspension in the air, which also reduces the liability to an explosion. Moreover, the reduced velocity of the air current creates less friction, as the friction of air varies with the square of the velocity of the current.

QUESTION—*Accidents from blasts and explosions of powder are on the increase. What should be done to reduce them? Answer fully.*

ANSWER—Where black powder is in use, all holes for blasting should be carefully examined before a miner is permitted to charge and fire a hole. The use of black powder should not be permitted in mines generating gas or dust and strict regulations should be made and enforced, limiting the amount of charge to be used in a single hole and the number of shots to be fired at one time, in a single place. Preferably, all shots should be examined, charged and fired by competent shotfirers after the men have left the mine. In mines generating gas and dust in dangerous quantity, only permissible powder should be employed and all shots should be charged and fired by competent shotfirers employed for that purpose.

QUESTION—*If the ventilation of a mine is insufficient, how may it be increased without increasing the power?*

ANSWER—To increase the circulation in a mine without increasing the power on the air, it is necessary to divide the current into two or more splits, so as to reduce the velocity of the passing air and the friction. Also, every obstruction to the free passage of the current should be removed and all breakthroughs and cross-cuts enlarged to the full section of the airway. As far as practicable, the length of air travel should be shortened and sharp bends in the air-courses avoided.

QUESTION—*Are there any precautions you could adopt to insure greater safety to the workmen in the mine, other than what is required by law?*

ANSWER—Greater safety in any mine is insured at the expense of constant, close, supervision of the work, not only to see that the mine is operated in compliance with the requirements of the law, but that all unsafe practices are eliminated and that everything is done to meet the special conditions that exist in that particular mine. For example, the practice of solid shooting, while safe in the mining of anthracite and other hard coal, if properly performed, is very unsafe in the mining of a soft friable coal and when performed by an inexperienced miner. Where the conditions require, which is the case in many mines, all shots should be examined, charged and fired by competent shotfirers employed for that purpose, and the work should be done after the men have left the mine.

Greater safety is assured by the use of permissible powders in place of black powder. Where men are hauled in and out of the mine on a special trip as provided by law, safety requires that no explosives or tools be carried by the men in that trip; but these should be sent into the mine on a separate trip. By a careful study of the conditions in his particular mine, every foreman will find the need of special precautions being taken to secure greater safety than what is mentioned in the law.

QUESTION—*What are the requirements of the law in Alabama in regard to handling and storing explosives in the mine? Where should they be kept and in what quantities?*

ANSWER—Regarding the handling of explosives in mine, Sec. 3 of the Alabama law requires a man's lamp to be placed 5 ft. away in the direction in which the air is moving; nor shall any person approach nearer than 10 ft. to an open can of powder, having a lighted lamp or pipe, or other fire with him. The same section forbids the opening of a can of powder with a pick or other tool.

In regard to storage of explosives in the mine, the law (Sec. 84) requires such explosives to be kept in a locked wooden box, placed as far as practicable from other boxes and from the track, and not nearer than 100 ft. to any working place. Black powder or other loose material for blasting must be carried into the mine, by the miner, in a proper receptacle having a securely fastened top. The law (Sec. 85) forbids blasting powder or other explosives being stored in the mine and no workman is permitted to have in his place, at one time, an amount greater than what is specified by the rules and regulations of the mine. More than one kind of explosive must not be placed in the same hole. The law forbids (Sec. 86) a person having in his possession any explosives other than that permitted by the rules of the mine, and permits (Sec. 88) the use of dynamite in the mine, only by the written consent of the foreman or other person in charge, stating the use intended.

QUESTION—*How many cubic feet of air passes along an airway 6 ft. high and 10 ft. wide, the velocity being 450 ft. per min.?*

ANSWER—The sectional area of this airway is $6 \times 10 = 60$ sq.ft. Then, for an average velocity of 450 ft. per min., the quantity of air passing is $60 \times 450 =$ 27,000 cu.ft. per min.

Labor and Its Handling Make "Astounding" Progress in Efficiency

A report on the efficiency of labor and efficiency in handling labor will be issued soon by the Department of Commerce, Secretary Hoover having caused a special study of these related subjects to be made for some months.

The report, it is said, will show that "astounding" progress has been made in the United States in the last ten years. Labor turnover has been reduced materially by improvement of management, the report will show, while the efficiency of labor also has improved.

In view of the attitude of the administration against material relaxation of the immigration laws, the forthcoming report is considered of especial importance.

In the opinion of Secretary Hoover, industry must look to increased efficiency, not only of labor but in handling labor, to solve its labor problems, rather than to an influx of foreign workers.

M-O-I Coal Convention Program Maturing

The program for the annual convention of the Michigan-Ohio-Indiana Coal Association, to be held in Cincinnati, May 22 to 24, is rapidly taking shape according to an announcement by B. F. Nigh, of Columbus, secretary of the association. Plans for entertainment as well as the business program provide for three full days and the biggest meeting in the history of the association is expected.

The business program has not been completed, but one of the leading speakers will be Tom L. Lewis, advisor to the New River Coal Operators' Association, on "What Is the Matter with the Coal Industry?" J. D. A. Morrow, of the Morrow Callahan Coal Co., also will speak, as will J. A. Morris, chairman of the operating committee of the American Railway Association, whose subject will be "The Railroad Outlook." Headquarters will be at the Sinton Hotel.

Automobiles will be provided for all visiting ladies both for shopping and sightseeing. The entertainment program for the members will include a barbecue and other features. Nothing will be left undone to make the meeting a success.

Coal-Mine Fatalities Drop in March

Fatal accidents to employees at coal mines throughout the United States during March, 1923, according to reports received by the U. S. Bureau of Mines from state mine inspectors, numbered 168, as compared with 296 in February, 1923, and 196 in March, 1922. The fatality rate was 2.99 per million tons, based upon a production of 56,205,000 tons in March, as against a rate of 5.93 for February of the present year and 3.34 for March a year ago.

During the first three months of 1923 661 fatalities have occurred at coal mines, representing a fatality rate of 4.01 per million tons based upon an output of 164,999,000 tons of coal. In the corresponding three months last year the fatality rate per million tons was 3.95, the fatalities numbering 593 and the production of coal being 150,098,000 tons. The fatal-accident rate for March during the ten years 1913-1922 has averaged 4.06 per million tons.

An explosion of coal dust on March 2 at a mine at Arista, W. Va., resulted in the death of ten men. This explosion brought the number of "major disasters" for the present year to 3 with a loss of 135 lives, while the first three months of 1922 showed 6 similar disasters with **71 lives lost.**

Comparing the fatalities by causes for the first three months of 1923 with the corresponding period of last year, the figures for 1923 show reductions in the fatality rates per million tons from falls of roof and coal, haulage, and explosives. The rate for electricity has remained practically unchanged, while that for gas and dust explosions has increased about 66 per cent. The comparative fatality rates per million tons for the three-month periods were:

	1922	1923
Falls of roof and coal	1.819	1.703
Haulage	.760	.570
Gas and dust explosions	.600	1.000
Explosives	.193	.121
Electricity	.106	.103

COAL-MINE FATALITIES DURING MARCH, 1923, BY CAUSES AND STATES

(Compiled by Bureau of Mines and Published by *Coal Age*)

State	Underground													Shaft					Surface							Total by States	
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotive.	Gas explosions and burning gas.	Coal-dust explosions (including gas and dust combined).	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1923	1922
Alabama	5		1					2					8													8	6
Alaska																										0	0
Arkansas																										0	0
Colorado		1	2										3													3	25
Illinois	5	1	2	2									10													10	12
Indiana			2	1	2								5													5	4
Iowa	1												1													1	3
Kansas				3									3													3	1
Kentucky	3	1	1	1									6													6	8
Maryland	1												1													1	0
Michigan										1			1													1	0
Missouri	1							1					2													2	1
Montana	1												1													1	1
New Mexico																										0	2
North Dakota																										0	0
Ohio	4											1	5			1		1		1			1		2	8	11
Oklahoma																										0	1
Pennsylvania (bituminous)	11	4	4			3		2				1	25	1				1	2				1	2	5	31	27
South Dakota																										0	0
Tennessee	2												2													2	2
Texas																										0	0
Utah	1		1	2									4													4	3
Virginia	1		1										2													2	2
Washington	1												1													1	2
West Virginia	17	2	4		10	1							34								1				1	35	32
Wyoming	2												2													2	2
Total (bituminous)	56	9	18	9	12	4		5		1		2	116	1		1		2	2	1	1		2	2	8	126	145
Pennsylvania (anthracite)	15	7	6		1	3						1	33	1	1			2	1					6	7	42	51
Total, March, 1923	71	16	24	9	13	7		5		1		3	149	2	1	1		4	3	1	1		2	8	15	168	
Total, March, 1922	77	15	38	10	18	10		5		3		5	181	2		1		3	2	1	3		2	4	12		196

No Coal Stringency in Interior of Germany After Three Months' Occupation of Ruhr

By H. O. Herzog

Berlin, April 12, 1923.—More than three months having elapsed since the occupation of the Ruhr began a comprehensive survey of the German coal situation resulting therefrom in the occupied zones and in the German interior is possible. From the beginning a policy was adopted of keeping up production as far as possible and of employing men not actually engaged in production in clearing up, repair and development work, to a large part at the expense of the state. After the first turmoil had passed production settled down to a rate of about 70 per cent of normal, which since then has slowly but steadily shrunk.

From the beginning of the occupation on Jan. 11 to the end of January, when the blockade of the Ruhr came into force, the fuel ready for shipment was rushed to the German interior. Since then shipments by rail have dwindled by degrees to an average of 35,000 tons per day, or 12 to 15 per cent of normal. This is attributed to disorganization of the railway system. In the main the shipments go to Italy (to which country the reparation supply is maintained), to Holland and Switzerland in fulfillment of standing export contracts, and to consumers in the occupied parts. Shipments by water have almost stopped, the most important water-way, the Rhine-Herne Canal, having been blocked by two scuttled coal barges.

In addition to the officially recorded shipments a large part of the output is shipped over private junctions and by road vehicles to large consumers in the proximity, chiefly cokeries and iron works. Cokeries are so well supplied that during the three months of occupation they have been able to maintain their usual rate of production. Consumers have taken up rather more than their requirements in order to relieve the already congested pitheads. Nevertheless accumulations of coal and coke were estimated at the end of March at nearly 7,000,000 tons.

Organization Efforts of French Futile

This has been accomplished in spite of efforts by the occupying force to organize the removal of fuel. These efforts were first concentrated on the transportation problem, which presented far greater difficulties than had been anticipated. The German railway force lends no help whatsoever in this respect; on the contrary, carefully devised acts of sabotage are found a great hindrance. The automatic control employed in the network of railway lines in the Ruhr lends itself particularly to such a policy of obstruction. All junctions in the heart of the district are controlled from a central station, which has most effectively been put out of gear. The congestion of traffic in this part of the district has become so great that it defies all remedial efforts under present circumstances. It will take many weeks after the restoration of normal conditions to disentangle it. Conspicuous in the jam are a large number of fully loaded coal trains which neither party is able to shift one inch.

In view of such conditions the occupying force has restricted its efforts to the northern part of the system, which, being detached from the network in the interior, offers the least difficulties. Of the 1,600 miles of railway lines in the Ruhr about 400 miles have been put into commission by the occupying force. Service at a greatly reduced extent is maintained on them by makeshift methods. Similar conditions prevail with regard to the loading operations. The passive resistance in this respect is highly organized.

When the mines receive warning of approaching seizure, the hoisting and conveying machinery is rapidly but effectively put out of gear and its connection with the power house is severed. Essential parts are removed and hidden. To replace them is nearly impossible without an intimate knowledge of their design. In consequence the alien engineers have to resort to the most primitive methods of loading —by shovels, baskets and wheelbarrows. The headway made is therefore extremely slow. According to an official German statement the total of fuel removed by the occupying force from the beginning of the occupation up to the end of March amounts to 230,000 tons of coal and coke compared with a preoccupation supply which for the time indicated would have been 4,200,000 tons.

When it is remembered that 500-ton trains used to leave the Ruhr for France and Belgium at intervals of 10 minutes during 20 hours of the day and that nearly one-fourth of the German working force was employed for these shipments, it seems impossible that more than a small fraction of the usual reparation supply can be removed while passive resistance is in force in the entire district. No wavering in the resistance is observable; on the contrary, occasional acts of sabotage are committed such as the destruction of the Rhine-Herne Canal, which was about to be reopened to traffic. The concrete structure of the canal spanning the river Emscher was blown up at the point of crossing, the canal thus being laid dry for many months.

German Interior Gets No Ruhr Coal

The situation in the German interior, against which the Ruhr blockade is chiefly directed, has withstood the strain considerably better than could have been expected. The fact is clearly shown that the coal reserves in the country at the beginning of the occupation were much larger than was commonly assumed and officially stated. Since the end of January no Ruhr coal has reached the German interior, except the output of several mines in a detached area east of the occupied zone, having an average output of 400,000 tons of coal and 100,000 tons of coke per month, which has been gradually increasing. Apart from these mines the German supply rests now solely on the output of Upper Silesia, Lower Silesia and Saxony, in addition to the Central German brown coal output.

The three coal fields named produce a combined monthly average of 1,600,000 tons of coal and 230,000 tons of coke. Efforts to increase this output by overtime and work on Sundays have failed, indicating that the labor situation is not so well in hand as official announcements proclaimed. It showed in February even a drop compared with the January output. In March a larger falling off was noted owing to strikes in Upper Silesia. Production of brown coal has been increased slightly, but the remarkable fact developed that the increase was not readily absorbed by the market.

Imports have in no way assumed unusual proportions. The expected wild rush for foreign coal has not materialized, although British coal was temporarily cheaper than German. Total coal imports in January were 1,870,000 tons, which corresponds with the average of the latter part of last year. Five hundred and forty-two thousand tons of this came from Great Britain and 1,230,000 tons from Poland. The size of the latter quota is unusual. A considerable part of it came from Poland proper. As the amount exceeds the usual surplus available for export from both Polish Upper Silesia and the Dombrova basin combined it cannot be considered a permanency, especially as Austria, Hungary and Italy in part, as well as other small surrounding countries are dependent on the Polish supply. It was obtained by Germany by rushing all available rolling stock to the mines, thereby outdistancing other bidders that are not in so fortunate a position. Imports from Poland have since fallen to the normal of about 600,000 tons per month.

British imports, on the other hand, have risen to over 1,000,000 tons. The supply of Bohemian brown coal, which approaches in quality the low grades of bituminous coal, has been increased to nearly 300,000 tons per month. Dur-

ing March British imports further increased. In addition a number of orders were placed with the American market. The first consignment of American coal of 12,000 tons arrived early in April. South Africa is under consideration as a further source of supply. Negotiations in this direction have led to business on a small scale.

Imports during the first three months of the year averaged 2,000,000 tons per month. Only a small part of this quantity can be looked upon as in substitution of the 4,000,000 tons of coal and coke usually supplied by the Ruhr, unless it be assumed that last year's imports were not for actual demand but as a provision against an emergency like the Ruhr occupation, which indeed has been an impending danger for nearly two years. This assumption is corroborated by the fact that after three months of Ruhr occupation no actual stringency in the German interior is in sight. Husbanding measures by the authorities are peculiarly absent; as an illustration it may be mentioned that the embargo put on coal-tar products has been lifted on the ground that the coal situation turned out to be more favorable than had been previously assumed.

There is not the shadow of a doubt that the coal situation during the first months of the occupation has been largely supported by reserves. German demand will therefore become more pressing as these reserves dwindle. On the other hand consumption is gradually decreasing in proportion to the growing business depression. The latter is in no way a consequence of the Ruhr occupation, as is frequently supposed erroneously, but is chiefly due to the marked stabilization. In this respect the situation gives signs of growing distress. German imports have increased largely as the result of the artificially high mark rate, which has forced German prices above the world market level. Exports are declining in equal proportion, thus further widening the gulf in the country's foreign trade balance. The present situation is maintained under an enormous financial strain, evidenced by the rapidly rising flood of internal indebtedness. The government's scoop on the hoarders of foreign money by the mark stabilization combined with a severe curtailing of credits has considerably weakened the financial position of the industry. The question of how long Germany can maintain her front has become chiefly a financial problem. It can clearly be seen that Germany's remaining strength is being spent at a rate which she cannot hope to maintain much longer.

Northwest Rate Fight Starts This Week

The battle before the Interstate Commerce Commission over Northwestern coal rates was scheduled to start on Wednesday of this week at Minneapolis in hearings on five complaints. The dock operators are appealing for an increase in rail rates to the Northwest from Illinois, Indiana and Midwestern fields and the states thus attacked are lining up their defense.

The case of the dock operators has been pretty well explained to the U. S. Coal Commission so that the Illinois and Indiana men go into the hearing feeling they know what sort of ammunition their opponents are going to use. They have kept a tight mouth about their own case but they expect to tell the commission that they see no reason for making the people of the Northwest pay higher prices for coal just because the docks cannot meet rail competition. Furthermore, they will point out that the docks are not robbed by rates of quite as much territory as they claim although it is a fact that Illinois coal can be laid down in the Twin Cities for approximately 50c. a ton cheaper than dock coal. North of that point the field is a fair one with no favors, though the dock men will point out that Illinois coal can reach Minneapolis for $3.46 and then proceed to Duluth for an additional 31c. whereas it costs $1.82 to ship a ton from Duluth down to Minneapolis.

The case is an extensive one and may take a month for the first hearing alone. The further procedure that invariably follows in such a case is bound to drag it along for months if not for years. Illinois men are saying that it is foolish for Northwestern buyers to delay purchasing in the hope that a new rate schedule will be worked out this summer.

Docks are not buying heavily for summer stocking yet, but this is attributed to the many consolidation deals that still impend. No dock owner wants to be caught with heavy supplies on hand if he is to be absorbed in a combine.

Illinois Legislators Angered at Herrin Officials in Public Quiz

Dumbness, bad memory, evasion, defiance and all other sorts of defence which officials of "bloody Williamson" County raised last week to protect themselves in a public investigation at Marion, Ill., did not discourage a legislative committee which is trying to find out why troops were not sent to Herrin last summer in time to prevent the massacre. The committeemen grew irate and verbally flayed two or three of the witnesses and learned little that is valuable to them, but they did not give up the job. Warned that they had better stop such an investigation lest something happen to them, the committeemen declare they will take the investigation up the state to Springfield, the capital, and there compel full testimony or inflict grievous punishment.

Under questioning by the committee three men who were deputy sheriffs at the time of the massacre brazenly said they did not do anything to stop the attack on the Lester strip mine at Herrin because they did not know anything was going on. One man declared he did not intend to tell the committee anything either in Marion or anywhere they might summon him. Melvin Thaxton, who was sheriff at the time but who is now County Treasurer, could not satisfactorily explain to the committee why he had told Colonel Sam Hunter, of the state militita, that he had twenty deputies ready when as a matter of fact he had only three, nor why he considered the riot situation "in hand" while an armed mob marched unhampered to its bloody work, nor why he went away on the morning of the massacre, nor anything else. His answers were bland and dull.

Though it was plainly evident all week to the legislators that they were extremely unwelcome visitors in Williamson County, and mutterings were heard on all sides, they stuck to their job and quizzed every witness they could get. Some "could not be found."

Among other witnesses was Delos Duty, State's Attorney, who helped conduct the murder cases against two groups of the many United Mine Workers indicted for murder of the twenty-two non-union strip miners killed after they had surrendered under their flag of truce. Duty admitted he knew the night before the massacre that two union men had been shot down near Carbondale, a few miles from Herrin, by somebody, presumably guards of the imported strip miners. Yet in spite of that he told the committee he did not think the situation was as serious as it turned out to be and therefore he did not insist upon state troops coming in. He said Colonel Hunter that evening telephoned Adjutant General Carlos Black that "all was quiet." Colonel Hunter denies this telephone report to General Black and took a member of the committee to the local telephone office, where no record of such a call on that night was to be found.

William H. Warder, an old attorney of Marion and regarded as a most substantial citizen, told the committee that he was active before the massacre in trying to organize a citizens' committee to prevent trouble. He said that if he had been the adjutant general of the state he would have gone to Herrin personally on the strength of the grave reports which he knew Colonel Hunter turned in. He praised that officer for his efforts to get troops to the scene of trouble.

"Do you believe that troops could have prevented what happened?" a committeeman asked.

"If properly handled, yes. If not, they might have caused something much worse," he replied.

All in all, the legislative committee thus far has discovered little in the quest to learn why troops were not sent to Herrin after Colonel Hunter "repeatedly" asked for them. Adjutant General Black insists Colonel Hunter made no such requests. Witnesses in Williamson County have testified on both sides of this point. Some heard Colonel Hunter picture the situation as exceedingly dangerous and others heard him say "all is quiet." Adjutant General Black is trying to dismiss Colonel Hunter from the service.

Increase of 2,000,000 Tons per Month in Continental Demand for British Coal Laid to Ruhr Occupation

The occupation of the Ruhr and the practical elimination of Ruhr coal from European markets is causing an added demand of more than 2,000,000 tons of British coal per month for Continental consumption, according to a statement prepared by the Western European Division of the Department of Commerce. The statement continues:

"British coal exports are increasing and the price of coal is rising. The quantity available for domestic consumption is considerably in excess of last year. Production in the British iron and steel industry is now 50 per cent in excess of the 1922 figures and only slightly below the pre-war average. In the face of these facts, the loss of production during the Easter holidays, amounting to nearly 3,000,000 tons, is considered important.

"In 1922 British coal production amounted to 252,000,000 tons, of which 82,000,000 were either exported or used for foreign bunkering, leaving 170,000,000 for home consumption, an average of 3,150,000 tons per week. During February an average of 5,537,000 tons was produced weekly, of which 1,925,000 went abroad, leaving 3,612,000 for home consumption. In March an average of 5,510,000 tons was produced weekly, of which 1,930,000 tons went abroad, leaving 3,580,000 tons for home consumption. March exports of coal amounted to 7,180,000 tons. For February and March the margin of coal for domestic consumption was only 14 per cent above the monthly average for 1922, while demand for coal has increased to a much greater extent.

"One method of calculating the increased demand is a comparison of steel production. The monthly average production of steel ingots and castings during 1922 was 486,000 tons. In January 624,000 tons were produced, or 30 per cent above the 1922 average. In February 707,100 tons were produced, or 48 per cent above the 1922 average. In March 802,500 tons were produced, or 65 per cent above the 1922 average. With the steel industry producing at a rate more than 50 per cent above last year's average and coal production but 15 per cent increased, it is considered not surprising that coal prices have risen until the best grades of South Wales coal are quoted at over £2 a ton for export.

"The increased Continental demand for British coal during February was partly accounted for as follows: France imported 1,375,000 tons, 375,000 above the average before the Ruhr occupation; Italy imported 675,000 tons, or 175,000 above previous imports; Germany imported over 1,000,000 tons, or 250,000 more than the average during 1922; Belgium imported 425,000 tons, while previously almost no British coal was consumed in that country. Additional shipments for German account probably are contained in the figures for Holland and Denmark, while these countries used increased quantities of British coal on their own account in place of supplies previously obtained from the Ruhr. In March France and Germany each imported 1,800,000 tons of British coal, or a combined excess of 1,750,000 tons above the 1922 monthly average. While the situation in the Saar basin is partly improved by the return of some of the strikers to work, production is still below normal. This causes additional demand upon the French coal reserve. Altogether, it is apparent that as long as the Ruhr deadlock continues, western Europe is facing a probable net shortage of coal, which provides an opportunity for shipments from the United States. Under these circumstances, the loss of production in Great Britain due to the Easter holidays is significant.

"For the week ending March 31 British coal production was 4,874,000 tons; for the week ending April 7 it was 3,941,000 tons a combined net loss of almost 3,000,000 tons from the average figure of 5,700,000 tons per week previously maintained. However, the latest returns show that during the week ended April 14, 5,776,000 tons were mined, the largest weekly output in the last four years."

Merge Five Pittsburgh Coal Companies

The Bertha-Consumers Co. was organized in Pittsburgh, Pa., April 25, representing a merger of the Bertha Coal Co., the Consumers Fuel Co., the Consolidated Fuel Co., Marshall Fuel Corporation and the Jewel Coal Co.

The new company has a capital of $10,000,000, and the annual production at present is 6,000,000 tons, with immediate development contemplated to existing properties to make it 8,000,000 tons. There are twenty mines involved, and 40,000 acres of coal land, located in Pennsylvania, Ohio, West Virginia and Kentucky. The combined organization has 1,000 stockholders.

John H. Jones, of Pittsburgh, is president and founder of most of the companies merged. Most of the companies were of themselves mergers of smaller companies in the past. The merger becomes immediately effective, and is one of the largest that has taken place in the Pittsburgh coal fields in years. The general offices of the company are in Pittsburgh.

Head of Williams & Peters Dies

Richard H. Williams, of the coal firm of Williams & Peters and also a director of the Federal Reserve Bank of New York, died Saturday, April 28, at his home, 4 West Fifty-first Street, New York City, after a short illness. He was in his sixty-ninth year. He was born in New York City and was educated at private schools and at Columbia University. After leaving college he helped to organize the firm of Williams & Peters, coal dealers, at 1 Broadway, and was its senior member at the time of his death. Since 1885 the firm has handled the anthracite business of the Erie R.R., which includes the Pennsylvania Coal Co.

On being appointed to the Federal Reserve Bank directorate, Mr. Williams resigned as a director of the National Park Bank and the Fulton Trust Co. He was a director of the Pennsylvania Coal Co., a director and member of the executive committee of the Equitable Life Assurance Society, a director and member of the finance committee of the Atlantic Mutual Insurance Co., and a director of several other corporations. He was generally known as a banker rather than as a coal man.

He was a member of the Sons of the Revolution and the Mayflower Descendants and also held membership in many clubs.

Mr. Williams leaves a wife, who was formerly Miss Sarah Welford Peters; a daughter, wife of the Hon. Cecil Campbell, of London, and a son, Richard H. Williams, Jr., of New York City.

Funeral services were held Monday morning at 10 o'clock at Grace Episcopal Church, Broadway and Tenth Street.

Commission Issues Retail Questionnaire

Through its retail section the U. S. Coal Commission has sent to retail dealers a new questionnaire designated R-70, which requires among other data, the form and date of organization, and the names of officers, directors and stockholders. Later pages ask for a copy of the balance sheets, profit and loss statements and the amount of loans outstanding for the years 1918 to 1922, inclusive.

Costs are classified under three general heads: general and administrative expenses, yard expenses and delivery expenses, with twenty-six separate items distributed among these three main heads.

WE DON'T NEED a nationalization of the coal industry, but we do need a rationalization of the coal miners.—*Cleveland Times.*

Midwestern Coal Sages Foresee Good Summer and Autumn Business

There is some optimism among midwestern wise men of coal. They look forward to the summer with hopes of a steadily though slowly rising market and of the movement of more summer coal than ever before. There are several reasons assigned: The "stock-now" propaganda is beginning to have a slight effect already. Most coal buyers can see for themselves that railroads probably will be jammed with freight next winter and unable to handle a tremendous volume of coal in the cold months. Nobody knows whether the soft-coal miners will strike again next April or whether the anthracite men will choose to quit Sept. 1. It will soon dawn on the country that in view of the present conditions of transport and coal demand prices are now at rock bottom and there is no point to waiting for another drop.

The "stock-now" campaign, strenuous though it has been officially, is only just beginning to sink in where it will do the most good. For instance, the railways announced they were going to stock heavily during the summer starting at once so as to get much of their own coal off the lines before the autumn rush. Few have done anything about it. In the Middle West the Burlington is the first to act, principally because President Hale Holden was one of the men most active in the stocking program recommended to all roads. His company is now busily putting 500,000 tons on the ground at various points from Chicago westward. The Wabash is putting down 200,000 tons, which represents only thirty days' normal consumption. Most other roads in the middle section of the country are only talking about it. It is believed they will all act soon, however.

Car-loading reports running over 900,000 cars a week are pretty good arguments to support the statement that railroads are going to be so busy the rest of the summer that nobody can count on them being anxious to haul a great burst of coal next autumn, when general freight is almost sure to be even heavier than it is now. This fact also is sinking home on coal consumers. While there appears to be plenty of coal equipment ready for the use of mines right now, the fact is that if any considerable number of mines now shut down were to reopen, this supply, running up to 100 per cent in spots such as on the Illinois Central in western Kentucky, would be stretched out thin. This is one of the reasons why prices show a tendency to turn and rise, though they still remain low throughout the Middle West.

As one sales manager of a great company sees it: "We'll have a steadily rising business from June 1 to Dec. 15. Then there will be a drop. We will be wondering where our usual winter market is. It will have been filled in advance. This country is going to see the greatest stocking movement in years. Already it is starting among retail dealers in the bigger cities, and it will spread."

They Sling Mud at Each Other in the Illinois Union of Brotherly Love

John L. Lewis, president of the United Mine Workers, is not the only mine union leader who has his Brophy. Frank Farrington, president of the Illinois miners, has his in the person of John J. Watt, secretary-treasurer of the union sub-district centering at Springfield, Ill. Watt has worried Farrington politically at every opportunity. Recently he made a veiled charge that Farrington was mishandling the Herrin defense fund of 1 per cent per month assessed against every Illinois union miner, which now totals $800,000, according to Watt. This was grounds for an appeal to President Lewis to unseat Farrington.

Reaching that point, the row broke out in full-page advertisements in Springfield papers. Watt challenged Farrington to debate "The Evils of the Present Illinois Compensation Law," declaring the Ohio compensation law is better and should be adopted in Illinois. Farrington shied around the debate, charging Watt with being an "under-cover man," treacherous to the union and planning to try to cause a wildcat strike in Illinois so as to shatter the union organization. Watt replied with various and sundry squirts of mud, bringing to light the fact that John L. Lewis said that Farrington, Vice-President Fishwick and Robert M. Medill, director of the Illinois Department of Mines and Minerals, split money three ways in return for making a compact with William J. Lester permitting Lester's company to strip the coal whose ultimate loading caused the Herrin massacre.

And so the battle goes merrily on in the papers, leading from one subject to another, at so much a page, with the membership of the United Mine Workers as the bleachers crowd looking on and hooting approval of the hot shots and violent epithets each union official casts at the other under the salutation: "Dear sir and brother." A pleasant time is being had by all.

J. P. Cameron, Pittsburgh Operator, Dies

John P. Cameron, forty-three years old, a member of the Pittsburgh coal firm of Crawford & Cameron, died suddenly of pneumonia Monday, April 23, at his home in Pittsburgh. He had been ill only three days.

Mr. Cameron was born in Houtzdale, Pa. In 1911 he became associated in business with L. F. Crawford, handling electrical mine supplies. He was president of the West Branch Mining Co., a director of the Peale, Peacock & Kerr Co. of New York; vice president of the Lindley Coal Co., a director and treasurer of the Jefferson Gas Coal Co., a director and treasurer of the Jefferson Coal & Coke Co., a director of the Goodman Manufacturing Co. of Chicago, and was president of the Royal Coal Co. During the war Mr. Cameron was a member of the Fuel Administration, stationed in Altoona.

JOHN P. CAMERON

Mr. Cameron leaves one son, William R. Cameron; three brothers, A. P. Cameron, of Irwin, Pa.; S. P. Cameron, of Girard College, Philadelphia, and William R. Cameron of Philadelphia, and five sisters, Mrs. George S. Ramsey, of St. Mary's, Pa.; Mrs. H. R. Hoard, of Philadelphia, Mrs. George H. Gearhardt, of Lexington, Ky.; Miss Anne R. Cameron, of Philadelphia, and Miss Christine M. Cameron, of Philadelphia.

Government Fuel Yards Ask Coal Bids

Bids for furnishing 201,800 tons of low-volatile coal to supply the fuel requirements of the Government Fuel Yards in Washington, D. C., were asked April 28 by the U. S. Bureau of Mines.

The total tonnages and the kinds of coal required are as follows: 4,750 tons New River nut and slack through 2-in. screen; 170,500 tons New River run-of-mine; 25,000 tons Maryland, Pennsylvania, or northern West Virginia run-of-mine; 1,600 tons gas over ¾-in. screen. Under the specifications, deliveries must be made during the period from June 1, 1923, to March 31, 1924.

Bids to furnish the coal required will be opened by the Chief Engineer of the Government Fuel Yards May 15, at 2 p.m.

REPRESENTATIVES OF FEDERAL FUEL DISTRIBUTOR WADLEIGH have completed their studies of the question of community coal storage in Chicago and began similar studies in Indianapolis this week.

Coal Commission Seeks Means to Prevent Strikes; Hammond Deprecates Government Control

By Paul Wooton
Washington Correspondent of *Coal Age*

An impelling reason why operators and mine workers should devise means to reduce the possibilities of coal shortages is the growing conviction that emergencies in the future will be met in a more drastic way than were those of the past. The President's Coal Commission is urging that constructive suggestions be brought forward. The way now is open for anyone to suggest how mine operators and mine workers can live together with less discord. It is admitted that if there were no coal strikes, coal emergencies would be few. If there is no assurance that strikes are to be fewer, probabilities seem to point to the proposal of legislation which would set up special machinery which could be called into use whenever an emergency threatened. There is reason to believe that experience during the emergencies of the last few years has been such as to condemn any halfway measures. The organization that may be proposed most likely will be along the lines suggested by General Goethals, that is, to empower the President to appoint a fuel administrator in the face of an emergency. Such an administrator would have the powers of a dictator whose orders could not be interfered with by the Interstate Commerce Commission or any other federal body or official, save the President himself.

The members of the Coal Commission who just have returned from a visit to the anthracite region saw much in which they were interested. Chairman Hammond declares that the engineering practice among the large anthracite producers is splendid and is much ahead of that in the bituminous fields. The physical production of anthracite, he stated on his return, is handled so well that no radical improvement can be suggested or expected. The mining is well done and he doubts if any material economies can be effected under present conditions. He pointed out, however, that his observation is a general one and is not based on the detailed study, the results of which will be available later, being made of the coal that is left unmined.

The existing machinery for conciliating differences between operators and their employees impressed Mr. Hammond very favorably. While in the anthracite field, however, he heard some complaints that the time required to pass upon grievances is excessive. The commission will discuss the possibilities of making suggestions for the improvement of conciliation procedure and will consider whether or not such machinery could be employed to advantage in bituminous districts.

The main difficulty in anthracite comes in its distribution, Mr. Hammond said. Unnecessary turnovers result in high prices to the ultimate consumer. This reference was independent of the question of royalty. No attempt was made on the anthracite trip to investigate that factor in anthracite costs. This is to be taken up actively. Among those who will be heard on the subject is Senator Pepper, of Pennsylvania.

Mr. Hammond expressed particular interest in the stripping operations. He saw no evidences of destitution at any point visited by the commission. There were some indications of lack of thrift on the part of some of the anthracite workers. He spoke favorably of the housing provided by the companies, but did observe some bad housing conditions in the small towns outside of company jurisdiction. The members of the commission climbed around some underground, but Mr. Hammond is not strongly impressed with the advantages gained from such visits. They are necessarily hurried and it is probable that such trips into the bituminous fields will be limited.

The members of the commission discussed the labor situation with representatives of the operators and of the miners and urged them not to wait until the last minute to reach an agreement. Mr. Hammond's personal conclusion is that an amicable settlement will be reached.

Amplifying the thought expressed the week before by Governor Marshall, Chairman Hammond voiced the hope that the commission will receive more constructive suggestions now that it is reaching the point where conclusions must begin to take shape. He said that he does not want to see nationalization of mines or any more government control than is necessary. He suggested that leaders among the mine workers and among the operators arrange conferences in the hope of ironing out some of their internal troubles.

During the course of Saturday's conference Mr. Hammond reiterated his belief in storage. He still believes greater elasticity in operation can be effected if some storage is provided at the mine mouth. He commended the policy being pursued by the public utilities in providing ample reserves of coal.

Exchange of Trade Information Through Associations Again Up in Supreme Court

Arguments were presented April 25 and 26 before the U. S. Supreme Court in the case of the government against the American Linseed Oil Co. and others, involving the right of business to exchange trade information through associations or through private bureaus acting as clearing houses for such data. The case is considered to be the most important to trade associations since the hardwood lumber case, but it involves different questions than the latter.

The federal government alleged that by exchanging various forms of information which were distributed as statistics by the Armstrong Bureau of Related Industries the defendant linseed oil companies created a condition tending to prevent competition in prices of their product. The U. S. District Court for Northern Illinois, where the suit originally was instituted in 1921, held for the defendants and ordered the suit dismissed, the government appealing.

In arguing before the Supreme Court, Special Assistant Attorney General James A. Fowler declared that daily and instantaneous price reports were sent the bureau by the linseed oil members, and relayed back to the members by the bureau, charging that each day each member knew the prices quoted by his competitors.

Thomas M. Debevoise appeared as attorney for the American Linseed Oil Co. and John Walsh, formerly chief counsel for the Federal Trade Commission, appeared in behalf of the Armstrong Bureau and other defendants. They argued that while various statistical information was exchanged through the bureau, there was no restriction of output and no combination or agreement as to price. Prices of the oil followed the flaxseed market, they argued. The right of business corporations to compile statistics on which to base judgment was upheld, they contended, by the fact that the Department of Commerce gathers and distributes statistics of business.

The Quartermaster General of the Army has called for bids, to be opened May 9, covering the following coal requirements: Fitzsimmons General Hospital, Bunell, Colo., 1,000 tons; Fort Sam Houston, 3,000 tons.

Bids to be opened by the Army on May 3 cover the following coal supplies: 3,000 tons for Rock Island Arsenal; 1,000 tons for Fort Riley, Kan.; 3,650 tons for Fort Leavenworth, Kan.; 2,000 tons for Fairfield Air Depot, Osborn, Ohio; 1,000 tons for Fort Benjamin Harrison, Ind.; 600 tons for Fort Crook, Neb.; 700 tons for Fort Des Moines, Iowa; 1,000 tons for Fort Omaha, Neb.

Take Coal Cases to Supreme Court

Three coal cases involving the U. S. Government have reached the U. S. Supreme Court. In one case the government has filed a motion to dismiss the appeal of the Corona Coal Co. in a suit for additional compensation for coal requisitioned by the Railroad Administration. The coal company brought an action in the U. S. Court of Claims for $107,431.99, the difference between the contract price and the Fuel Administration price.

In the other two cases the Supreme Court has signified its willingness to hear arguments in the actions brought by Willard Sutherland Co. and by William C. Atwater & Co., Inc., against the United States, the question at issue being whether certain contracts with the Navy Department are to be considered "requirements" contracts and whether under them companies can be required to furnish excess tonnage at the contract price.

Never Averaged 200 Days Work per Year, Says Union Plasterer

Interesting evidence on the irregularity of employment among plasterers was brought out April 24, in the Criminal Branch of the New York Supreme Court, where thirty-six members of the Plasterers' Union, Local 60, are on trial, charged with conspiracy in connection with building operations in New York City from 1920 to 1922. Michael J. Colleran, president of the union and also president of the new Building Trades Council, testified that there were less than 200 working days in the year for plasterers.

As "irregularity" and "seasonal nature of the industry" never fail to play a prominent part in criticism and investigations of the coal industry, the following excerpts from Colleran's testimony should prove of more than passing interest:

Q—Under Art. 10 of the constitution with relation to wages, Sec. 2 of that article provides that your men are only to work on Saturday a half day. Now what I want to know is if the men only work a half day on Saturday, do they get a full day's pay or do they only get paid for a half a day?

A—For a half a day.

Q—And any of these holidays that have been enumerated, are those holidays with pay, or holidays without pay?

A—Without pay.

Q—Now, I also asked you before concerning the amount of time—the amount of days—that you in your experience, estimated that the men could work in the plastering industry. Will you give me the figures on that again?

A—Do you mean approximately how many days a plasterer can work?

Q—Yes, during the year.

A—During the year. I will have to in my own way do that.

The Court—Hasn't that been figured by the State Labor people? Somebody said 210 days.

Mr. Goldstein—The State figured it out but I want to show how he arrives at his figures.

Witness—There is 52 Sundays on which there is no work done. There is 52 Saturdays which would constitute half a day, which would constitute 26 whole days. There is eleven holidays. A total of 89. There is 89 days that work is not to be done at all. Eighty-nine from 365.

Mr. Untermyer—You mean except as overtime.

Witness—With the exception of overtime. That is 276 days. Our trade being a seasonable trade, you take the months of December and January. After we leave this commercial district and go out into the apartment houses and so forth, those two months are practically nil as far as work is concerned. That would be sixty days taken from that, which would make 217 days.

The Court—We have already taken out eight of those for Sundays and Saturdays.

Witness—Yes, that is counting those in.

Mr. Untermyer—That is besides the holidays.

Witness—Yes, I am bringing it down to show that around 210 days would be the approximate of all the days that a man could work if he had the work to do, and then when you figure in the heat of the summer, when the laborers quit, you lose a day or two days. In the spring of the year when it rains, the laborers quit, you lose one or two days, that is in a week—one or two days in a week—and also when the job is complete you are laid off, requiring you to go out the next day and look for a job. Taking all those into consideration you do not make 200 days. I think I worked about as much as any plasterer in the organization when working with the tools, and I never averaged anything over that.

Charge Dock Operators with Monopoly

The Northwestern Coal Dock Operators' Association, Minneapolis, Minn., its officers, directors and members have been cited in formal complaint by the Federal Trade Commission charging a conspiracy to suppress competition and create a monopoly in the sale of anthracite and bituminous coal at wholesale and retail in the Northwest territory. The complaint alleges both a violation of the Federal Trade Commission Act, because of unfair competition, and of the Clayton Act by reason of price discriminations. Thirty days are allowed to file answer, after which time the case will be set for trial.

It should be borne in mind that the issue of the commission's complaint is merely a citation which states the commission's reason to believe, based upon preliminary inquiry, that the charges of the complaint are true; in other words, the complaint simply initiates a proceeding to get at the facts in an orderly legal manner.

The officers and directors of the association named as respondents are: President, W. W. Broughton; Vice-President, J. L. McMahon; Secretary, W. A. Prinsen, and directors W. W. Broughton, Peter Reiss, H. E. Smith, E. N. Saunders, Jr., E. A. Uhrig, J. L. McMahon, F. G. Hartwell and W. H. Goodwin. The members of the association named as respondents are Pittsburgh Coal Co. of Wisconsin, Minneapolis, Minn.; Northwestern Fuel Co., St. Paul, Minn.; C. Reiss Coal Co., Sheboygan, Wis.; Clarkson Coal & Dock Co., St. Paul, Minn.; M. A. Hanna Coal & Dock Co., Cleveland, Ohio; Carnegie Dock & Fuel Co., Pittsburgh, Pa.; Berwind Fuel Co., Chicago, Ill.; Northern Coal & Dock Co., St. Paul, Minn.; Great Lakes Coal & Dock Co., Minneapolis, Minn.; Pittsburgh & Ashland Coal & Dock Co., Cleveland.

It is stated in the complaint that the respondent companies are the largest distributors of both anthracite and bituminous coal in the Northwest territory and handle in the aggregate approximately 80 per cent of all coal passing over the docks of Duluth, Minn.; Washburn, Ashland, Superior, Sheboygan and Milwaukee, Wis. The "Northwest territory" as described in the complaint comprises the States of Minnesota, Wisconsin, North Dakota, South Dakota and portions of Iowa and Nebraska. Retail branches are maintained by respondent in the cities of Duluth, St. Paul and Minneapolis. It is in this territory that the commission has reason to believe that the respondents have suppressed competition and are obtaining and maintaining a monopoly.

Among the practices of the respondents which are challenged in the complaint are (1) circulation among the respondents of suggested price lists and official price lists before they are actually issued, it being generally understood that the prices so submitted would be maintained by the respondent companies issuing same; (2) circulating lists of retail dealers to whom the respondent refused to sell for any reason whatsoever with a key indicating the reason for such refusal to sell; (3) selling coal in the cities of St. Paul and Minneapolis at prices less than received for the same grade of coal at the same time in the same quantities in Duluth, Minn.; (4) arbitrarily cutting the price of bituminous coal to compel competitors to join the association and to cease selling below the respondents' list price and subsequently arbitrarily raising the price of coal after competitors had joined the association; (5) using a uniform contract with retail dealers and large consumers prohibiting the purchaser from diverting or using the coal for other purposes than outlined in the contract; (6) refraining from soliciting certain municipal business, recognizing such business as the prospect of the local retail dealer; (7) refusing to sell or ship coal to retail dealers in the country trade not equipped with the usual equipment of a retail coal dealer.

Sign New Wage Agreement in District 10

District 10, United Mine Workers, and the five remaining union coal companies in the State of Washington have signed a new wage agreement which will run until March 31, 1924, the basic rate being $7.50 for daymen instead of $8.25, which the miners desired. Work was resumed May 1.

Bituminous Operators' Committee Asks Probe of Miners' War Chest

Investigation of the uses made of an alleged $15,000,000 annual war chest obtained by the United Mine Workers of America through the "check-off" system, and complete abolition or regulation of that system, is requested of the U. S. Coal Commission in a letter from counsel for the Bituminous Operators' Special Committee, made public on April 30. Pointing out that union leaders "compel the operators to serve as tax collectors by requiring them to deduct these assessments from the pay of the workers," Colonel Henry L. Stimson and Goldthwaite Dorr, who signed the letter, charge that the funds thus raised constitute the commissariat of a tightening labor monopoly.

"The amount a miner must contribute to this taxation," the letter asserts, "frequently equals or exceeds what he has to pay for rent. In some districts the monthly tax has even run as high as $15 per man. In some districts the initiation fee has been set even as high as $75. Their monopoly cannot be achieved without this system of forced contribution. Time and again it has been shown that without the compulsory machinery of the 'check-off,' this organization cannot reach its monopolistic objective. Mine workers again and again have refused to support it except under compulsion. Its legitimate activities do not need the support of this burdensome taxation. . . .

"In order to help make these studies constructive and to furnish the basis for remedial action [against acts of violence] there is a thread running through them all which we ask the commission itself to follow. Campaigns such as these which the United Mine Workers have been carrying on require money in vast sums. As the cases already presented have shown and as those we are about to present will still further show, they are not spontaneous uprisings of men goaded by grievances; they are deliberate campaigns waged with a central, organized purpose, backed by a central, well-filled treasury. In order to understand how they can be carried on, this financial system must be understood; in order to prevent their recurrence and curb their excesses, this system must be abolished or regulated. . . .

"The huge fund of the United Mine Workers, stated to be in excess of $15,000,000, raised annually by this system of taxation is an outstanding fact of labor relations in the coal industry. The secret disbursement of this huge fund without public accountability, taken in connection with a nation-wide campaign of violence and of defense of the perpetrators of violence, is a sinister fact of this industry.

"We therefore respectfully suggest that no investigation into the facts of the coal industry by this fact-finding commission can be complete without a drastic public investigation into and airing of these facts. No remedy can be suggested until the magnitude of this evil is understood and corrective measures to curb it devised. We therefore request the commission to investigate the amounts which are raised annually by 'checking off' the dues and assessments and fines of the United Mine Workers of America from the wages of miners.

"We ask it further to end the secrecy that has shrouded the use of these funds and trace relentlessly—as it alone has the power to do—the application which has for years past been made of the vast sums thus raised. . . .

"We believe that the people of this country have no conception of the extent to which the United Mine Workers have disregarded, flouted and escaped the law in their campaigns to extend and protect their closed-shop monopoly. We believe they have little conception of the violence and magnitude of these same campaigns. The public is the chief party in interest before the commission. If the economic welfare of the nation, and the security of its fundamental institutions are being threatened by a militant monopoly, the sinister power of which depends upon its ability to use a great war chest without public accountability, then the nation is entitled to know this fact.

"We therefore believe that a complete investigation of the full facts is imperative in the public interest."

Miners' Union in Realm of High Finance

The current report of the auditors of the United Mine Workers of America, published in the *Mine Workers' Journal* of April 15, 1923, shows actual cash on hand as of Feb. 1, 1923, as $1,182,259.44. During the period under review—Aug. 1, 1922, to Jan. 31, 1923—the union raised more than two and a quarter millions. The actual receipts during the six months period were $2,786,140.38. The main sources of income were the tax of $927,250.19 and the assessment of $1,466,472.34. This is a total of almost $2,400,000, equivalent to about $4 per member.

Included in receipts are the bank loans. They were $150,000 from the Indiana National Bank of Indianapolis, which has been paid back; $50,000 from the Harriman National Bank of New York, which during the period covered by the audit received payment of $150,000 in returned loans, and $50,000 from the Bank of the United States, New York City, which amount has likewise been returned.

Significant items, in view of the visit of President John L. Lewis to England, is a donation of $22,350 from British miners and a payment to the International Miners' Federation of $547.50 as dues.

The most interesting details are those of expenditure. For example, W. Jett Lauck, who has been retained by the U. S. Coal Commission, drew $14,000 during the six months for "preparing statistical data." District No. 7 and District No. 9 each got $10,000 as aid, and District No. 1 got $15,000. These are the anthracite districts. During the half year lawyers collected fees aggregating a trifle under $100,000. The largest single amount went to Earl E. Houck, designated as "assistant to the attorneys." For no specified reason Mr. Houck got $6,510.30, and for "legal expenses, West Virginia cases," he got $40,000. Besides these "legal expenses, West Virginia cases," nearly $5,000 was paid to attorneys in District 29, which has headquarters in Beckley, W. Va. This money was divided as follows: C. M. Ward, $1,200; J. E. Summerfield, $1,006.51; John I. Hutchinson, $2,250; Kyle D. Harper, $598.78; C. B. Summerfield, $227.50.

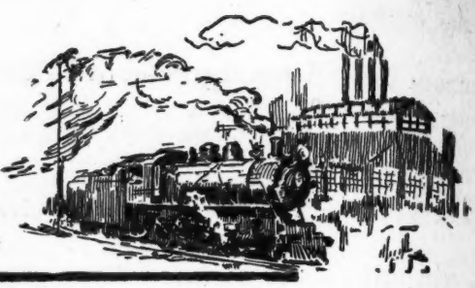
The firm of Hughes, Rounds, Schurman & Dwight got $21,452.39 for legal services in the Coronado case. William A. Glasgow, Jr., counsel for the International union, was paid $939.56.

The union holds no securities except $301,550 in U. S. Liberty and Victory bonds. Its cash is divided into $873,494.13 on deposit in the United States and only $47,952.52 on deposit in Canada. Outstanding checks amounted to $40,737.21 on Feb. 1. The recapitulation is:

Amount on hand, Aug. 1, 1922	$731,349.66
Income, Aug. 1, 1922-Feb. 1, 1923	2,786,140.38
Total	3,517,490.04
Expenditures	2,335,230.60
Balance on hand, Feb. 1, 1923	1,182,259.44

REPRESENTATIVE MEN IN THE MINING INDUSTRY considered the question of industrial relations at a luncheon given by the American Mining Congress Friday, April 27, at the Bankers Club in New York. Sydney J. Jennings, president of the American Mining Congress, presided and addresses were made by W. A. Grieves, chairman of the Division of Industrial Co-operation of the Mining Congress, on the work of that organization, and by J. F. Callbreath, on proposed enlargement of activity of the industrial co-operation division of the Mining Congress.

Production and the Market



Weekly Review

The record month of April has closed with production of over 42,000,000 net tons of bituminous coal, equalled or excelled in but one other April, that of 1918, when production was 46,000,000 tons. April usually is the low month of the year for the soft-coal industry. Spot prices of bituminous coal, though on the decline for the past four months, averaged higher in April, 1923, than in any previous April save 1917, before governmental war control of prices, and 1920, when price fixing ceased. The average spot price of soft coal at the mine, according to *Coal Age* compilations, was $2.88 per net ton in April, 1923, compared with $3.21 in April, 1917, and $3.85 in 1920.

Anthracite, on the other hand, although running at top speed, is breaking no records. Total production in April was around 8,000,000 net tons, a familiar figure since it was almost reached in the Aprils of 1913, 1917 and 1921, and topped in 1914, 1915 and 1918.

Soft-Coal Prices Weak

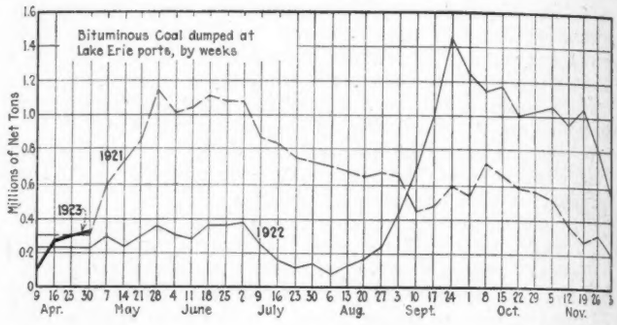
The soft-coal market continues dull and all prices are weak. Inquiries for future business are increasing and the trade is waiting for Lake business to open soon and give some additional impetus to trading.

Smokeless, southern Illinois, eastern and western Kentucky, Somerset, Clearfield, Pittsburgh, Ohio and Kanawha coals declined in price last week. *Coal Age* Index of spot prices of bituminous coal declined 7 points from April 23 and on April 30 was 224. The corresponding average price is $2.71.

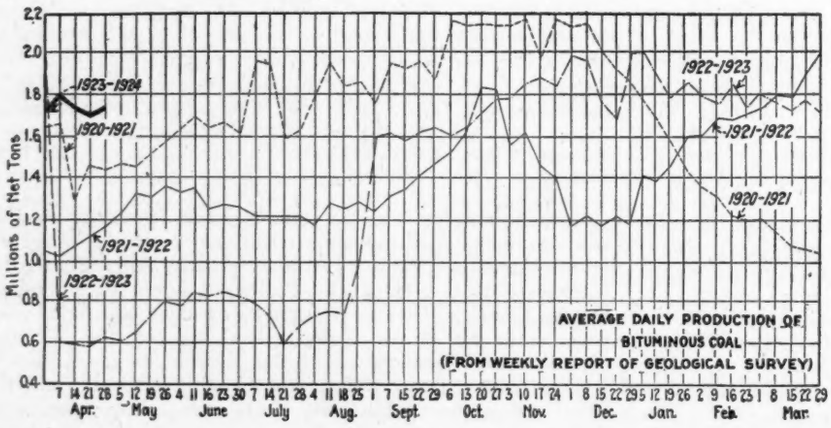
Each week more small operations are being closed because of low prices, particularly in central Pennsylvania, where many are hard pressed for orders. With the cheaper coals accumulating, producers are resorting to all means possible to move their product. The lack of orders in many districts has become more noticeable because of an improvement in car supply, this condition being principally attributed to limited production in Illinois, Indiana, southern Ohio and Cumberland-Piedmont districts.

Throughout the Middle West there is little activity and considerable urging is needed to move coal. The steam sizes are particularly sluggish in the Chicago market. There is a pronounced weakness in all grades in the Ohio markets with the exception of smokeless coals. Dealers are buying only to meet requirements.

Spot inquiry was light throughout the East, although there were increasing inquiries as to future business, with strong indications of heavy industrial purchasing soon. With embargoes in New England slightly modified there are indications that buying there will soon increase considerably. Little interest is being shown in May coal.



The general tone of the export market shows a slight improvement. Spot business to South America is a trifle more active. France continues to get considerable American coal, this being particularly true with regard to shipments from Baltimore, where 18 out of 29 vessels leaving that port during the first 21 days of April departed for France carrying 104,598 tons of cargo coal. From Jan. 1 to April 21 there have been 21 vessels leaving Baltimore for French ports with 121,310 tons of



Estimates of Production

(Net Tons)

	1922	1923
BITUMINOUS		
April 7	3,835,000	9,629,000
April 14 (*b*)	3,656,000	10,401,000
April 21 (*a*)	3,575,000	10,244,000
Daily average	596,000	1,707,000
Calendar year	140,354,000	169,416,000
Daily av. cal. year	1,485,000	1,789,000
ANTHRACITE		
April 7	9,000	1,602,000
April 14	6,000	2,067,000
April 21	6,000	2,065,000
Calendar year	21,798,000	31,602,000
COKE		
April 14 (*b*)	140,000	421,000
April 21 (*a*)	94,000	437,000
Calendar year	2,217,000	5,995,000

(*a*) Subject to revision. (*b*) Revised from last report.

cargo coal. Coke movement for export is quiet, some distressed product being offered at low prices.

The lake situation is not yet in full swing. Heavy ice impedes traffic in the upper Lakes. There are many boats loaded at Lake Erie ports but they are not likely to be moved until after the first week of the present month.

"The present estimate of the total soft coal raised during the week April 16-21," says the Geological Survey, "including coal coked, local sales and mine fuel, is 10,244,000 net tons, which is 157,000 tons less than in the week preceding. It is, however, nearly three times the output in the corresponding week of a year ago, which was marked by the low point of production during the great strike. Preliminary reports of cars loaded in the week April 23-28 show a slight increase in the rate of production during the early days of the week and it is probable that the total output will be between 10,300,000 and 10,400,000 tons."

Dumpings at Hampton Roads for all accounts for the week ended April 26 totaled 323,855 net tons as compared with 377,538 tons dumped in the previous week.

Demand for domestic sizes of anthracite remains active. Most retail dealers complain of short supplies, while the steam sizes continue to accumulate and are draggy. Minneapolis and St. Paul retail dealers are laying in heavy supplies which so far have gone to them by rail, and they are looking forward to the opening of Lake navigation, when they expect increased shipments.

Midwestern Business More Sluggish

Every coal in the Middle Western markets needs a good deal of pushing just now and steam sizes are so sluggish that they hardly move at all no matter how vigorous the push. Southern Illinois screenings sagged until at the end of the week very little of it touched $2. Most of it moved at $1.75 or $1.80. Naturally all other steam coals were equally under downward pressure, with the result that a good deal of it moved at $1.50.

Southern Illinois domestic sizes are still moving at a little under the $3.85 price fixed on the circular, some of the worst selling down to $2.75. The increase to $4.10 effective May 1 did not force much buying. No other field

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

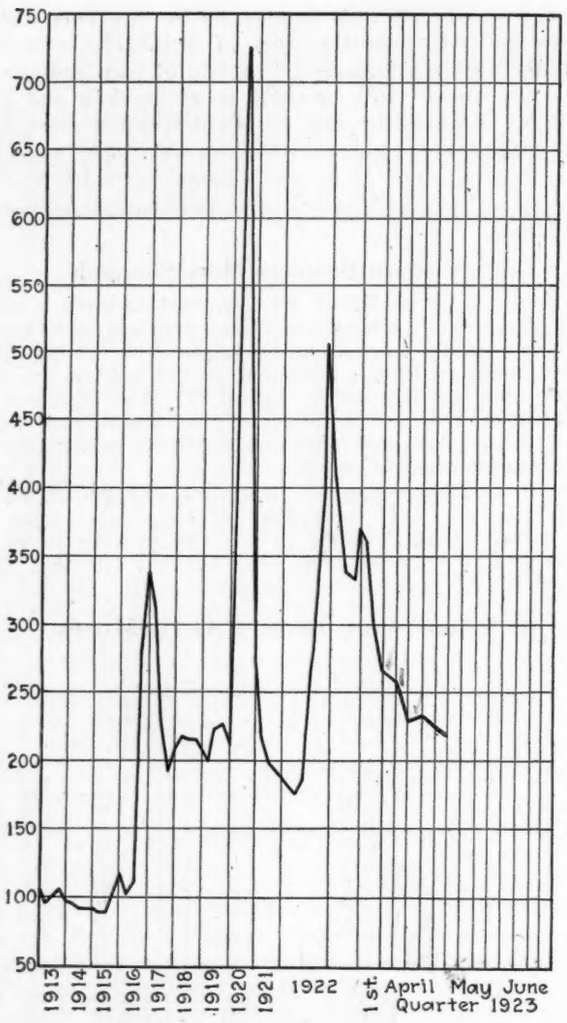
	Market Quoted	May 1 1922	Apr. 16 1923	Apr. 23 1923	Apr. 30 1923†
Low-Volatile, Eastern					
Smokeless lump	Columbus	$3.05	$6.10	$6.15	*$6.00@$6.25*
Smokeless mine run	Columbus	2.40	4.25	4.25	*3.75@ 4.50*
Smokeless screenings	Columbus	1.75	4.00	4.10	*3.75@ 4.25*
Smokeless lump	Chicago	2.75	6.10	6.10	6.00@ 6.25
Smokeless mine run	Chicago	1.95	3.75	3.85	3.75@ 4.00
Smokeless lump	Cincinnati	2.90	6.35	6.35	*6.00*
Smokeless mine run	Cincinnati	2.15	4.25	4.25	*3.75@ 4.00*
Smokeless screenings	Cincinnati	2.15	4.10	4.00	*3.75@ 4.00*
*Smokeless mine run	Boston	5.05	6.30	6.25	**6.25@ 6.50**
Clearfield mine run	Boston	2.60	2.95	2.75	*2.00@ 3.25*
Cambria mine run	Boston	3.00	3.65	3.35	3.00@ 3.75
Somerset mine run	Boston	2.80	3.35	3.15	*2.50@ 3.50*
Pool 1 (Navy Standard)	New York	3.75	4.00	3.85	**3.75@ 4.25**
Pool 1 (Navy Standard)	Philadelphia	3.70	4.00	3.95	**3.90@ 4.25**
Pool 1 (Navy Standard)	Baltimore	3.75	.....	.....	.....
Pool 9 (Super. Low Vol.)	New York	3.25	3.25	3.10	2.75@ 3.50
Pool 9 (Super. Low Vol.)	Philadelphia	3.30	3.25	3.20	*2.90@ 3.35*
Pool 9 (Super. Low Vol.)	Baltimore	3.40	3.25	2.90	2.90
Pool 10 (H.Gr.Low Vol.)	New York	3.00	2.65	2.50	**2.25@ 3.00**
Pool 10 (H.Gr.Low Vol.)	Philadelphia	3.15	2.65	2.55	*2.30@ 2.70*
Pool 10 (H.Gr.Low Vol.)	Baltimore	3.25	2.90	2.50	2.50
Pool 11 (Low Vol.)	New York	2.75	2.30	2.05	2.00@ 2.50
Pool 11 (Low Vol.)	Philadelphia	2.80	2.25	.....	2.00@ 2.25
Pool 11 (Low Vol.)	Baltimore	3.10	2.25	2.15	2.15
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	2.70	2.05	1.85	*1.60@ 2.00*
Pool 54-64 (Gas and St.)	Philadelphia	2.50	2.20	2.20	*1.90@ 2.25*
Pool 54-64 (Gas and St.)	Baltimore	3.00	2.25	1.95	1.95
Pittsburgh sc'd gas	Pittsburgh	.....	3.10	3.10	*2.75@ 3.00*
Pittsburgh mine run (St.)	Pittsburgh	.....	2.00	2.00	2.00
Pittsburgh slack (Gas)	Pittsburgh	.....	2.15	2.10	*1.50@ 1.75*
Kanawha lump	Columbus	2.90	3.75	3.75	*3.25@ 4.00*
Kanawha mine run	Columbus	2.65	2.25	2.25	2.00@ 2.50
Kanawha screenings	Columbus	2.00	2.30	2.40	*2.00@ 2.25*
W. Va. lump	Cincinnati	2.75	3.50	3.85	*3.00@ 4.50*
W. Va. Gas mine run	Cincinnati	2.75	2.35	2.50	*2.10@ 2.75*
W. Va. Steam mine run	Cincinnati	2.40	2.35	2.50	*2.10@ 2.75*
W. Va. screenings	Cincinnati	2.20	2.15	2.25	2.00@ 2.50
Hocking lump	Columbus	3.05	3.00	2.85	2.75@ 3.00
Hocking mine run	Columbus	2.90	2.10	2.00	1.85@ 2.20
Hocking screenings	Columbus	2.15	1.60	1.70	1.60@ 1.80
Pitts. No. 8 lump	Cleveland	3.25	3.00	2.90	*2.25@ 3.50*
Pitts. No. 8 mine run	Cleveland	$2.90	$2.25	$2.15	$2.10@$2.25
Pitts. No. 8 screenings	Cleveland	2.90	1.95	1.95	*1.70@ 1.90*
Midwest					
Franklin, Ill. lump	Chicago	3.45	3.85	3.65	3.50@ 3.85
Franklin, Ill. mine run	Chicago	3.00	3.10	3.10	3.00@ 3.25
Franklin, Ill. screenings	Chicago	3.00	1.95	1.95	*1.75@ 2.00*
Central, Ill. lump	Chicago	2.75	2.75	2.70	2.65@ 2.75
Central, Ill. mine run	Chicago	2.75	2.10	2.10	2.00@ 2.25
Central, Ill. screenings	Chicago	2.00	1.55	1.55	1.50@ 1.65
Ind. 4th Vein lump	Chicago	3.15	3.35	3.35	3.25@ 3.50
Ind. 4th Vein mine run	Chicago	2.50	2.85	2.85	2.75@ 3.00
Ind. 4th Vein screenings	Chicago	2.25	1.85	1.85	1.75@ 2.00
Ind. 5th Vein lump	Chicago	2.60	2.85	2.85	2.75@ 3.00
Ind. 5th Vein mine run	Chicago	2.60	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	2.40	1.55	1.55	1.50@ 1.60
Standard lump	St. Louis	3.15	2.50	2.50	2.50
Standard mine run	St. Louis	2.75	1.85	1.85	1.75@ 2.00
Standard screenings	St. Louis	2.75	1.10	1.10	1.10
West Ky. lump	Louisville	2.60	2.50	2.50	**2.25@ 3.00**
West Ky. mine run	Louisville	2.60	2.10	2.10	*1.85@ 2.10*
West Ky. screenings	Louisville	2.60	2.00	1.90	*1.75@ 2.00*
West Ky. lump	Chicago	.....	2.60	2.60	2.50@ 2.75
West Ky. mine run	Chicago	.....	1.80	1.80	1.75@ 1.85
South and Southwest					
Big Seam lump	Birmingham	2.00	2.50	2.50	2.50
Big Seam mine run	Birmingham	1.70	2.10	2.10	2.00@ 2.25
Big Seam (washed)	Birmingham	1.85	2.35	2.35	2.25@ 2.50
S. E. Ky. lump	Chicago	.....	3.85	4.00	*3.50@ 4.00*
S. E. Ky. mine run	Chicago	.....	2.85	2.85	2.75@ 3.00
S. E. Ky. lump	Louisville	2.75	3.85	3.85	**3.50@ 4.50**
S. E. Ky. mine run	Louisville	2.75	2.75	2.60	**2.50@ 3.00**
S. E. Ky. screenings	Louisville	2.75	2.45	2.20	*2.00@ 2.50*
S. E. Ky. lump	Cincinnati	2.90	3.50	4.00	*3.00@ 4.00*
S. E. Ky. mine run	Cincinnati	2.40	2.25	2.25	2.00@ 2.50
S. E. Ky. screenings	Cincinnati	2.25	2.15	2.10	*1.75@ 2.25*
Kansas lump	Kansas City	4.25	3.85	3.85	3.25@ 4.50
Kansas mine run	Kansas City	4.15	3.25	3.25	3.00@ 3.50
Kansas screenings	Kansas City	2.65	2.60	2.60	2.50@ 2.75

* Gross tons, f.o.b. vessel, Hampton Roads.
† Advances over previous week shown in **heavy type**, declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Latest Pre-Strike Independent	Latest Pre-Strike Company	April 23, 1923 Independent	April 23, 1923 Company	April 30, 1923† Independent	April 30, 1923† Company
Broken	New York	$2.34	.....	$7.60@$7.75	.....	$7.75@$8.35	.....	$7.75@$8.35
Broken	Philadelphia	2.39	$7.00@$7.50	7.75@ 7.85	.....	7.90@ 8.10	.....	7.90@ 8.10
Egg	New York	2.34	7.60@ 7.75	7.60@ 7.85	$8.50@10.50	8.00@ 8.35	**$8.50@11.00**	8.00@ 8.35
Egg	Philadelphia	2.39	7.25@ 7.75	7.75	9.25@ 9.50	8.10@ 8.35	9.25@ 9.50	8.10@ 8.35
Egg	Chicago*	5.09	7.50	8.25	12.00@12.50	7.20@ 8.25	12.00@12.50	7.20@ 8.25
Stove	New York	2.34	7.90@ 8.20	7.90@ 8.10	8.50@10.50	8.00@ 8.35	**8.50@11.00**	8.00@ 8.35
Stove	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.25	9.25@ 9.50	8.15@ 8.35	9.25@ 9.50	8.15@ 8.35
Stove	Chicago*	5.09	7.75	8.25	12.00@12.50	7.35@ 8.25	12.00@12.50	7.35@ 8.25
Chestnut	New York	2.34	7.90@ 8.20	7.90@ 8.20	8.50@10.50	8.00@ 8.35	**8.50@11.00**	8.00@ 8.35
Chestnut	Philadelphia	2.39	7.85@ 8.10	8.05@ 8.15	9.25@ 9.50	8.15@ 8.35	9.25@ 9.50	8.15@ 8.35
Chestnut	Chicago*	5.09	7.75	8.25	12.00@12.50	7.35@ 8.35	12.00@12.50	7.35@ 8.35
Ranges	New York	2.34	.....	.....	.....	8.30	.....	8.30
Pea	New York	2.22	5.00@ 5.75	5.75@ 6.45	6.30@ 7.50	6.00@ 6.30	*6.30@ 7.25*	6.00@ 6.30
Pea	Philadelphia	2.14	5.50@ 6.00	6.10@ 6.25	7.00@ 7.25	6.15@ 6.20	7.00@ 7.25	6.15@ 6.20
Pea	Chicago*	4.79	6.00	6.25	7.00@ 8.00	5.49@ 6.03	7.00@ 8.00	5.49@ 6.03
Buckwheat No. 1	New York	2.22	2.75@ 3.00	3.50	2.25@ 3.50	3.50@ 4.15	2.25@ 3.50	3.50@ 4.15
Buckwheat No. 1	Philadelphia	2.14	2.75@ 3.25	3.50	3.00@ 3.50	3.50	3.00@ 3.50	3.50
Rice	New York	2.22	2.00@ 2.50	2.50	1.75@ 2.50	2.50	1.75@ 2.50	2.50
Rice	Philadelphia	2.14	2.00@ 2.50	2.50	2.00@ 2.50	2.50	2.00@ 2.50	2.50
Barley	New York	2.22	1.50@ 1.85	1.50	1.00@ 1.50	1.50	1.00@ 1.50	1.50
Barley	Philadelphia	2.14	1.50@ 1.75	1.50	1.15@ 1.50	1.50	1.15@ 1.50	1.50
Birdseye	New York	2.22	.....	2.00@ 2.50	.....	1.60	.....	1.60

*Net tons, f.o.b. mines †Advances over previous week shown in **heavy type**, declines in *italics*.



Coal Age Index 224, Week of April 30, 1923. Average spot price for same period $2.71. This diagram shows the relative, not the actual prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913, 1918," published by the Geological Survey and the War Industries Board.

except Mt. Olive has committed itself to a May price, everybody apparently expecting to pick off some of the sparse domestic business which the Franklin County people may lose by increasing the circular. Mt. Olive lump is to increase from $3.25 to $3.50. The cool of early spring persists in this region, thus keeping the immediate demand up for lump and egg sizes.

St. Louis Trade Is Quiet

An unusually quiet period prevails at St. Louis and probably will prevail for a few weeks. Very little storage coal is being put in except a little of the higher grades, such as anthracite and coke and some Carterville lump. There is no need for current use and the demand for Standard and Mt. Olive is off. Wagonload steam is light and carload steam is in a bad way, with very little moving. Country domestic is practically stopped and country steam is difficult to find. Indications are that there will be a good movement of early storage coal in May.

Retail prices advanced on Carterville May 1 so that the new prices are: Carterville, $7.75; Mt. Olive, $6.50; Standard, $5.75; smokeless, $14.50.

Kentucky Feels a Pick-Up

With better car supply in the western Kentucky fields movement of coal has been improving somewhat. It is reported that there is better demand from retailers for domestic sizes, due to the fact that retail yards are low, and while retailers are not planning to stock very heavily, they are taking a fair amount, believing prices are now at rock bottom. At the same time there is a good industrial demand for screenings, and prices are holding. Mine-run is not so active, but is moving fairly well.

More river coal is coming into Louisville now than for some time. Some concerns which haven't stocked much of it for the past several years, are planning to handle more this season.

Northwest Awaits Lake Coal

The market at Duluth remains tranquil, with the docks at low ebb, and prices firm. Buyers are holding off hoping that the new coal which will come up after the opening of navigation will be cheaper. There is no free anthracite on the docks and the bituminous unbought totals between 100,000 and 150,000 tons. There is a very evident disposition on the part of the consumers to buy anthracite early. Dock men place the probable price at about $1.50 lower than this year.

The coal business is at a standstill at Milwaukee pending the arrival of new supplies by lake. About fifteen cargoes destined for Milwaukee have been taken on at Lake Erie ports. The steamers will start as soon as the Straits of Mackinac are free from ice. A hopeful feeling prevails, and jobbers are looking forward to a busy May.

Retail prices on all-rail hard coal in the Twin Cities are advertised by one concern at $17.50 to $18 delivered for egg, stove and nut. Pea is $16. The soft coal trade is still awaiting developments, though wholesalers look for a considerably better season than that which just closed.

The Kansas market is dull. Such Missouri, Oklahoma and Kansas mines as are open run only two or three days a week. Those of Arkansas are getting even less. There has been no formal cut in prices. Householders are not buying, even in face of the assurance that the retail price of Arkansas semi-anthracite will advance at least 50c. early in May.

In Utah and the mountain states a cold snap during the week kept retailers busy but did not reflect itself in stronger demand upon the mines. There is very little general buying for steam purposes. Railroads are taking a little, but that is about all. No price changes in Utah coal have been announced.

Weakness Pronounced in Cincinnati

There was a pronounced weakness in all grades and sizes of coal, with the exception of smokeless, in the Cincinnati market, while comparison as made with the latter part of March show that the volume of coal on the open market was about doubled. On the other hand there is an increasing evidence of stocking going on in some sections. Orders are not numerous in the Columbus market and dealers are only buying what they actually need to meet requirements. Operators and jobbers in the Cleveland market say that due to the limited transportation facilities and heavier shipping to Lake ports, the volume of coal being offered in the open market is less than in some weeks, at the present rate of operations.

In the Pittsburgh district a few additional mines have closed on account of dissatisfaction with current prices. During the week ended April 22 there was a slight increase in production in the central Pennsylvania field, the output amounting to 18,084 cars as compared with 16,929 cars the previous week. Car supply improved slightly but not enough to keep the mines in continuous operation.

Buffalo reports little change in the situation. Stocks are running low but consumers appear unconcerned.

Inquiry and Receipts Low in New England

Spot inquiry in New England is extremely light. Aside from contract quotas, receipts have diminished and there is little tonnage available for distribution inland. Congestion at the re-handling wharves has been practically all cleared up, and prices on cars for best grades from the Pocahontas and New River districts range now from $8.00@ $8.25 per gross ton on cars. While the trade is hopeful

that prices will not now recede more than 25@50c. it is probable that by the end of May more radical reductions will take place. Buying is only on a hand-to-mouth basis.

The spot market f.o.b. Hampton Roads shows no material change. Output is still much restricted, although accumulations at the piers continue about the same as for the past thirty days. There are few purchasers of single cargoes, practically all of the loadings being applied on season requirements, and the outlook for increased movement coastwise is by no means encouraging. The agencies are looking to the Lake trade to assist liberally in building up tonnage for the latter part of May and during June, but if conditions are no better in western Pennsylvania there will be strong competition from that quarter. Quotations are maintained about on the minimum base price named on the navy requirements, but distinctly there is a feeling that coal could be bought on offers at figures down to $6 f.o.b. vessel.

New minimum prices have been heard during the past week, but takers are not many and receipts are steadily diminishing. Even the producers of choice Cambria coals have made slashes in quotations previously made and are closely canvassing all the trade they have ever been in touch with to get spot business.

New York Buyers Look for Lower Prices

Buyers in the New York market expect lower prices, while on the other hand producers and sales agents believe the bottom is nearly reached. Buying is slow in the Philadelphia market and producers are looking for orders. Demand at Baltimore is light. Contract making is considerably behind the average and there is little stocking up to this time. Interest is centered in the export situation as it affects Baltimore.

In the Birmingham, Ala. district the steam trade is quiet. Coal is accumulating, but this factor so far has not become a serious problem. Several railroads have closed contracts for their requirements covering the next twelve months and others have our proposals.

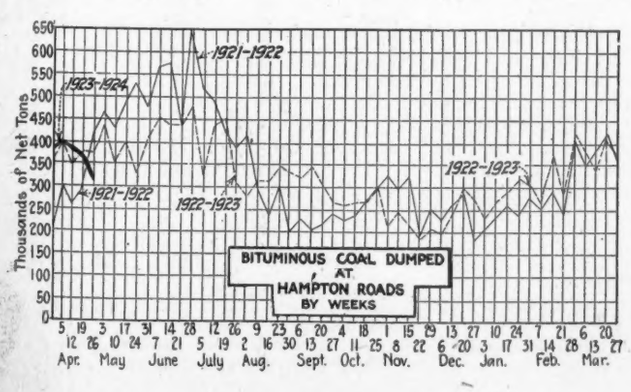
Lake Navigation Not in Full Swing Yet

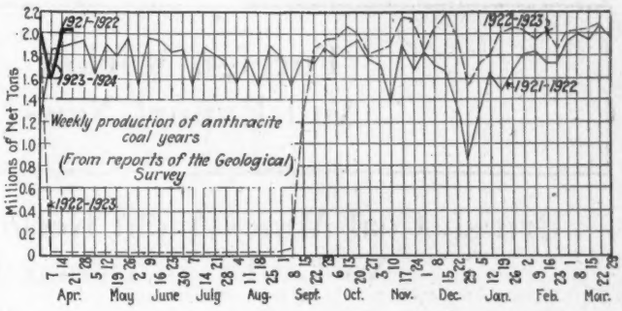
Lake navigation is not expected to open fully until about the middle of May. There is considerable ice in the upper Lakes and although many boats are loaded at Lake Erie ports they will wait for the ice to clear before starting for destinations. During the week ended April 30 soft coal dumped at Lake Erie ports amounted to 365,438 tons of cargo coal and 15,490 tons of fuel coal, making the dumpings to date 1,005,556 tons of cargo coal and 42,384 tons of fuel coal.

Domestic Anthracite Still Moves Rapidly

Domestic sizes of anthracite continue to move rapidly. Independent product is in heavy demand and it is said that many buyers, some from Canada, are canvassing the coal fields. The steam sizes are accumulating. It is reported that one or two producers have made contracts for large tonnages of rice coal on a basis of $1.75 per ton. Heavy shipments of the larger sizes are being made West.

"The rate of production of anthracite in the third week of April was the same as in the second week," the Geological Survey reports. "The total output in the week





ended April 21, including mine fuel, dredge and washery coal, and sales to local trade, is estimated at 2,065,000 net tons. The cumulative output during the present calendar year to April 21 stands at 31,602,000 net tons, an increase of 9,804,000 tons, or 45 per cent, over the production in the corresponding period of 1922."

Beehive Coke Output Gains

Production of beehive coke increased during the third week of April, according to the Geological Survey, to 437,000 net tons, as compared with 421,000 net tons the previous week. The cumulative production of beehive coke during 1923 to April 21 amounts to 5,995,000 tons as compared with 2,217,000 tons in the corresponding period of 1922 and 2,277,400 tons in 1921.

Anthracite Miners Call Off Button Strike

A strike of 10,000 anthracite mine workers at the Pennsylvania Coal Co. mines in the Pittston district was called off Monday, April 30, when mine foremen at a meeting with the general grievance committee, agreed to see that the thirty-five men who refused to join the union at the Butler colliery, which caused the suspension, get into good standing with the organization. The walkout was not sanctioned by the district officers of the union.

Work was resumed Tuesday, May 1.

How the Coal Fields Are Working

Percentages of full-time operation of bituminous coal mines, by fields, as reported by the U. S. Geological Survey in Table V of the Weekly Report.

	Jan. 1 to Apr. 1, 1922 Inclusive	Sept. 5 to Dec. 30, 1922 Inclusive	Jan. 1 to Apr. 14, 1923 Inclusive	Week Ended April 14, 1923
U. S. Total	55.7	...	...	...
Alabama	64.6	84.7	89.0	(a)
Somerset County	74.9	36.3	31.0	45.1
Panhandle, W. Va.	51.3	57.3	55.5	54.4
Westmoreland	58.8	65.8	55.2	64.6
Virginia	59.9	55.7	55.2	66.3
Harlan	54.8	22.1	23.2	30.8
Hazard	58.4	16.4	22.1	30.1
Pocahontas	60.0	36.6	38.0	42.6
Tug River	63.7	28.8	35.0	44.4
Logan	61.1	26.2	30.9	30.2
Cumberland-Piedmont	50.6	31.7	48.1	61.1
Winding Gulf	64.3	30.4	34.2	36.2
Kenova-Thacker	54.3	42.4	34.2	34.7
N. E. Kentucky	47.7	28.4	28.2	(a)
New River	37.9	31.6	36.0	35.5
Oklahoma	59.6	59.1	42.9	43.4
Iowa	78.4	75.9	79.3	63.8
Ohio, Eastern	46.6	40.8	35.4	38.1
Missouri	66.8	76.3	75.9	57.0
Illinois	54.5	49.9	47.1	38.3
Kansas	54.9	55.9	47.3	36.2
Indiana	53.8	37.7	51.7	42.5
Pittsburgh†	39.8	41.2	34.5	43.7
Central Pennsylvania	50.2	53.4	46.9	56.2
Fairmont	44.0	35.5	34.8	45.8
Western Kentucky	37.7	32.4	32.9	36.5
Pittsburgh*	31.9	56.1	59.2	62.3
Kanawha	13.0	15.6	23.0	21.8
Ohio, Southern	24.3	38.1	32.4	29.1

* Rail and river mines combined.
† Rail mines.
(a) No report.

Car Loadings, Surplusages and Shortages

	Cars Loaded All Cars	Cars Loaded Coal Cars
Week ended April 14, 1923	946,759	182,356
Previous week	895,767	164,089
Same week in 1922	700,155	64,171

	Surplus Cars All Cars	Surplus Cars Coal Cars	Car Shortage	
April 11, 1923	14,241	3,259	48,584	21,025
Same date in 1922	330,070	187,918	...	...
April 4, 1923	15,168	4,305	58,237	24,539

Foreign Market And Export News

British Coal Mines Yield Record Output; No Let-Up in Demand

A new high record in production was attained by Great Britain's mines during the week of April 14, when 5,777,000 tons of coal was produced, according to a cable to *Coal Age*. This is the record output for this year and also surpassed the output for any week of 1922, 5,742,000 tons having been produced during the week ended Dec. 16. The output for the week of April 7 was 3,941,000 tons.

Demand was irregular last week and quotations showed a slight decrease from the previous week.

According to a newspaper dispatch, South America has bought 100,000 tons of Monmouthshire large coal for delivery over the last half of this year on a basis of about 30s per ton at the mine.

Although most of the miners have returned to work following the recent labor troubles, and production increased, there has been no slackening in demand for Welsh coal. It is estimated the Welsh mines lost at least a fifth of their April production of the best steam coals and were compelled to carry their arrears of delivery into May.

Both contracts and inquiries from the Continent are steady and show no indication to fall off.

Coal exports officially reported from London for the week ended April 27, in tons follow:

South Wales district	2,300
Newcastle (Tyne) district	11,214

Board of Trade statistics showing coal exports during March of this year, compared with the same month of last year, in tons, follow:

	March 1923	March 1922
Germany	1,836,000	468,000
France	1,805,000	1,238,000
Italy	788,000	681,000
Argentine	184,000	132,000
Other countries	2,567,000	2,682,000
Total	7,180,000	5,201,000

Dumpings at Hampton Roads Decrease

Business at Hampton Roads was not so brisk last week, but large supplies of coal were in transit and accumulations at the piers substantial. The week ended with few vessels in sight, although the trade had a generally bright outlook.

The seamen's strike had not affected business at that port, and no fear was held by shippers of developments that would interfere with business. The general feeling was that the strike would not work any hardship there.

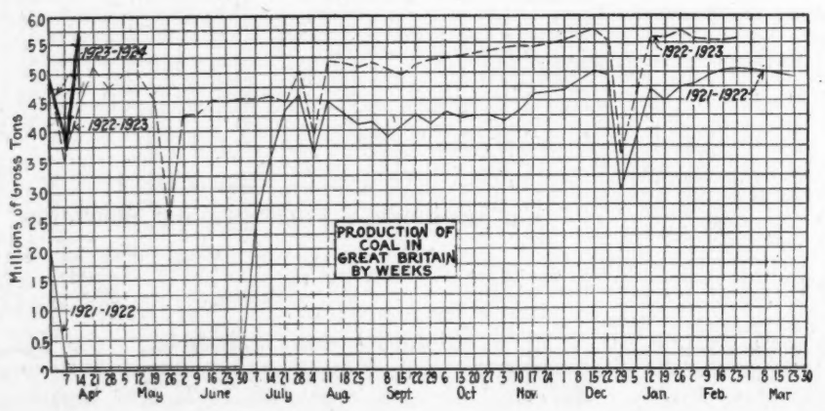
Coastwise trade held firm, while export business was good, with more coal moving to France and still other cargoes for France in sight. Contracts were not in evidence, and little faith in the strength of the market was held.

French Coal Production

During February, coal production in France, in metric tons, was as follows:

Districts:		Coal	Coke	Patent Fuel
Arras (devastated and non-devastated mines of the Department du Pas-de-Calais)		1,035,453	40,949	37,194
Douai (Department du Nord: all devastated mines)		374,384	38,035	75,201
Saint-Etienne (Loire coal field)		265,481	27,827	15,213
Lyons (Biansy, La Mure, etc.)		227,458	.....	23,143
Clermont-Ferrand (minor coal fields of the center of France)		103,546	.....	9,267
Southern Coal fields	Alais	146,791	583	55,279
	Toulouse	152,757	9,463	4,984
	Marseilles	66,112	.....	1,420
Minor coal fields of the West of France	Nantes	4,587	.....	71
	Bordeaux	4,097	.....	3,192
Nancy (Ronchamp colliery)		8,482	1,742	.....
Strasbourg (Lorraine coal field)		89,436	3,083	.....
Totals		2,478,584	121,682	224,964

Production in January amounted to 3,147,681 tons of coal, 131,994 tons of coke and 292,880 tons of patent fuel. Due to the strike in the Lorraine district coal produced during February was 314,936 tons less than in January and coke 5,033 tons less.



Swiss Coal Imports

During the year 1922 the total imports of coal into Switzerland amounted to 2,200,000 tons, as compared with 1,630,000 tons in the preceding year. Though the imports increased largely in 1922, yet they represented only two-thirds of those before the outbreak of the war. The steadily progressing electrification of the country decreases the demand for coal to a certain extent, the Gotthard line alone using now about 110,000 tons of coal less than before its electrification.

Export Clearances, Week Ended April 21, 1923

FROM HAMPTON ROADS

	Tons
For Bahamas:	
Amer. Schr. Edward R. Smith, for Nassau	442
For Cuba:	
Nor. SS. Songelv, for Havana	3,580
Nor. SS. Skogstad, for Havana	5,680
For France:	
Br. SS. Hambleton Range, for Dunkirk	5,848
For Mexico:	
Nor. SS. H. C. Flood, for Vera Cruz	2,650
For Norway:	
Nor. Bark Amasis, for Sandefjord	2,044
For West Indies:	
Nor. SS. Ringborg, for Barbados	4,023
Nor. SS. Sagoland, for Fort de France	3,787

FROM PHILADELPHIA

For Belgium:	
Dan. SS. Gudrun Maersk, for Antwerp (coke)	3,037
Swed. SS. Indianic, for Antwerp (coke)	...
For France:	
Belg. SS. Caledonier, for Dunkirk	...
Swed. SS. Lulea, for St. Nazaire	...

Hampton Roads Pier Situation

N. & W. piers, Lamberts Pt.	April 19	April 26
Cars on hand	1,191	1,307
Tons on hand	77,961	88,783
Tons dumped for week	136,941	95,033
Tonnage waiting	5,000	10,000
Virginian Ry. piers, Sewalls Pt.:		
Cars on hand	1,743	1,623
Tons on hand	98,950	94,830
Tons dumped for week	126,114	117,747
Tonnage waiting	17,619	3,989
C. & O. piers, Newport News:		
Cars on hand	2,603	2,526
Tons on hand	136,315	135,560
Tons dumped for week	74,033	76,377
Tonnage waiting	9,250	9,955

Pier and Bunker Prices, Gross Tons

PIERS

	April 21	April 28†
Pool 9, New York	$6.00@$6.35	**6.00@ 6.45**
Pool 10, New York	5.40@ 5.75	*5.25@ 5.75*
Pool 11, New York	4.50@ 5.00	4.50@ 5.00
Pool 9, Philadelphia	6.30@ 6.75	*6.25@ 6.70*
Pool 10, Philadelphia	5.40@ 5.80	*5.30@ 5.70*
Pool 11, Philadelphia	4.40@ 4.80	*4.30@ 4.70*
Pool 1, Hamp. Roads	6.25@ 6.50	**6.40**
Pools 5-6-7, Hamp. Rds.	5.25	**5.30**
Pool 2, Hamp. Roads	6.25@ 6.50	**6.40**

BUNKERS

Pool 9, New York	6.30@ 6.65	**6.30@ 6.75**
Pool 10, New York	5.70@ 6.05	*5.55@ 6.05*
Pool 11, New York	4.80@ 5.30	4.80@ 5.30
Pool 9, Philadelphia	6.60@ 6.85	**6.65@ 6.80**
Pool 10, Philadelhia	5.65@ 6.20	*5.55@ 6.10*
Pool 11, Philadelphia	4.70@ 5.15	*4.60@ 5.05*
Pool 1, Hamp. Roads	6.50	6.50
Pool 2, Hamp. Roads	6.50	6.50

Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations, by Cable to *Coal Age*

	April 21	April 28†
Admiralty, large	40s.@ 45s.	*40s.@ 42s.6d.*
Steam, smalls	30s.@ 32s.6d.	*30s.@ 31s.*
Newcastle:		
Best steams	34s.6d.@ 35s.	**35s.**
Best gas	32s.6d.@ 35s.	*30s.@ 32s.6d.*
Best bunkers	35s.	*34s.@ 35s.*

†Advances over previous week shown in **heavy** type; declines in *italics*.

News Items From Field and Trade

ALABAMA

The School of Mines of the College of Engineering of the University of Alabama offers five fellowships in mining and metallurgical research in co-operation with the U. S. Bureau of Mines, open to graduates of universities and engineering schools who have proper qualifications to undertake research investigation. The value of each fellowship is $540 per year of nine months beginning Sept. 1. The following problems have been selected for investigation for the year 1923-1924: (1) Beneficiation of Iron Ores: (a) High Silica Iron Ores. (b) Brown Iron Ores. (c) Gray Iron Ores (Partly magnetic). (2) Coal Washing.

Fellows will be exempt from all laboratory and non-resident fees and will only be required to pay a matriculation fee of $10, student activities fee of $13.50 per year and a diploma fee of $15. Applications are due not later than June 15th and should be addressed to H. D. Pallister, Professor of Mining Engineering, School of Mines, University of Alabama, University, Ala.

ALASKA

B. B. Stewart, supervising mining engineer for Alaska, announces **a big increase in production of coal by private operators** in 1922 on Alaskan public lands. The output last year in the territory amounted to 84,403 tons, as compared with 76,285 tons in 1921, an increase of 8,118 tons. Government operations on reserved units form less than 10 per cent of the total production.

COLORADO

SUMMARY OF COAL PRODUCTION OF COLORADO, 1922

Number of mines operated	275
New and old mines opened	36
Mines closed, 16; abandoned, 2; total	18
Sub-bituminous coal produced, tons	2,814,779
Semi-bituminous coal produced, tons	714,322
Bituminous coal produced, tons	6,441,444
Anthracite coal produced, tons	17,255
Semi-anthracite coal produced, tons	15,810
Total coal produced, tons	10,003,610
Increase, 1922	861,663
Run-of-mine coal produced, tons	3,727,227
Lump coal produced, tons	2,852,582
Nut coal produced, tons	664,832
Pea coal produced, tons	73,115
Slack produced, tons	2,685,854
Percentage of slack produced	42.8—
Coal mined by hand, tons	4,904,874
Coal mined by machine, tons	5,098,736
Kind and number of machines used: Compressed air, 176; electric, 297; total	473
Coal mined for shipment, tons	6,592,881
Coal shipped out of the state, tons	1,887,884
Coal sold to local trade and used by employees, tons	544,011
Coal used at the mines for steam and heat, tons	227,836
Coal made into coke, tons	750,998
Coke made, tons	490,668
Days coke ovens were operated	337.7
Coke ovens used	377
Men employed at coke ovens	173
Miners employed: Pick, 4,824; machine, 3,770; total	8,594
Total men employed in and about mines (average)	13,436
Number of employees, foreign born	6,222
Employees speaking English	12,363
Average days worked (man days)	199.54
Daily production per miner, tons	5.8
Annual production per miner, tons	1,164+
Number and type of safety lamps used: Flame, 883; electric, 4,906; total	5,739
Carbide lamps used	8,772
Pounds of carbide used (approximately)	213,456
Cost of development work in mines during 1922, 137 mines reporting	$779,202
Days lost account of car shortage, 109 mines reporting	5,619
Coal lost through shortage of labor (37 mines reporting), tons	489,975

ILLINOIS

Mine No. 2 of the Bell & Zoller Coal Co. at Zeigler, was scheduled to reopen April 25 after a two-week's shutdown following **a breakdown of the main hoisting engine.** While hoisting coal about three o'clock in the afternoon, the driving rod of the engine broke and both cylinder heads blew out. Nobody was hurt but the under frame was broken and had to be welded. **A strike of engineers** at about the same time took three men off the job but they were expected to return by the 25th.

Injury to six men and some property damage was done at Mine No. 12 of the Old Ben Coal Corporation recently at Christopher, when the steps in the airshaft of the mine gave way, letting six men fall a short distance to the bottom of the pit. Some of the injured men were engaged in repairing the steps when the accident happened while others were ascending the steps to leave the mine. It is the opinion of Superintendent L. T. Putnam that one of the higher flights of steps gave away and its weight caused the others to fall. The mine will not be operated until the steps and airshaft are repaired.

The mines of the Johnston City Coal Mining Co. at Johnston City **and the Freeman Coal Mining Co.** at Freeman **are to be electrified** according to announcements just made. The mines will also be equipped with electrical machinery and latest methods of mining by electrical equipment. The power for these mines is to be furnished by the Central Illinois Public Service Company, now supplying over 70 mines in Illinois with electrical power.

On Tuesday, April 17, **the No. 55 mine of the Springfield District Coal Mining Co. broke its previous hoisting record** of 2,452 tons, producing 2,602 tons. The mine is in charge of Mine Superintendent Harry Preval and Thomas Lawless, manager. This is considered a good record.

Recently the **No. 9 mine of the Consolidated Coal Co.**, located at Murphysboro, **has been closed down on account of high water** in the Big Muddy River. **The Security Coal & Mining Co.** at DuQuoin was about ready to resume operations after being closed down for four weeks on account of a creek breaking in, when the same creek got on a rampage again and poured in once more.

J. L. Bane and A. E. Butters, both of Ottawa, are interested in **a project to reopen the Rutland coal mine.** Rutland is a village near Ottawa on the Freeport division of the Illinois Central, the old "main line." Mr. Bane is the president of the Ottawa Ice & Fuel Co. and Mr. Butters is an attorney. The two men have offered to put in capital to the amount of $30,000 if Rutland citizens will raise $10,000. A meeting has been held in the village and $4,700 has been raised for the purpose.

Drillers for the Schuline Mining Co. on the Weir farm, near Sparta, **have completed their work,** as the drill has gone through the second vein of coal at a depth of 140 feet. The coal is 5 ft. 10 in. thick with a good roof. As soon as the shaft can be lowered from the first vein to the second vein, the mine will be worked. It was originally the intention to mine the first vein but it was found that this vein was of uneven thickness and could not be mined successfully so a decision was reached to drill to the second vein.

The Chicago Norfolk Western Coal Co., 343 South Dearborn Street, Chicago, has been incorporated with capital of $20,000 by L. C. Sieber, C. B. Sieber and J. L. Johnson.

The Coloma Coal and Lumber Co. of Virden, has been incorporated with capital of $45,000. N. E. Tiedebohl is the president; William H. Hocker, vice-president, and T. C. Tiedebohl, Jr., secretary and treasurer. The officers are the sole directors.

Fred Price, superintendent of the mine of the Tamaroa-Little Muddy Coal Co., at Tamaroa, has resigned on account of ill health caused from injuries received in a mine explosion a few months ago. He has been succeeded by Superintendent Frankey, formerly connected with a Freeburg mine. Two weeks ago the mine was forced to suspend operations for some time due to the caving in of a portion of the shaft. Excessive rains caused the walls of the shaft to give away. The damage has been repaired, however, and the mine is again operating as usual.

INDIANA

The Struggling Monkey mine, operated by Charles Whitlock, of Terre Haute, failed to meet the pay roll of the miners on Tuesday, April 10, regular pay day, and because of this fact the mine **has shut down,** with a possibility that work will not be resumed under the present management. The mine was started by the late Ben R. Whitcomb about six years ago. A deal is at present under way and if the negotiations are completed the plant will be taken over and operated by the Interurban Coal Co., which is now operating mines in Vigo, Clay and Sullivan counties. This company is owned principally by W. A. Satterlee, Henry Meyer and Dr. I. D. White, of Clinton.

IOWA

The new Pershing No. 2 mine will be located two and one-fourth miles north and east of the present location of Pershing No. 1 mine, a 3,000 tonner, making it about five miles from Tracy. The company hopes to be able to hoist 2,000 tons a day from the new shaft by winter. The new mine is to be electrically equipped throughout, drawing power from Des Moines through the Knoxville (Iowa) plant. The No. 1 Pershing mine has had an average of 600 men on the payroll all winter, and plans to have 450 or 500 men in the new works by next autumn.

The Summit Coal Co. of Nevada, is making arrangements to open a mine near that town.

KANSAS

Governor Davis has sent Edward T. Hackney, formerly a member of the state board of administration, **into the Kansas coal fields in response to the petition of many union locals urging the state government to do something to keep the coal mines working.** Mr. Hackney began by going over the Jackson-Walker Coal Co.'s books in Kansas City, Mo. Then he proceeded into the field. From there he went home to Wellington without making public the nature of his forthcoming report to the Governor. All the union petitions for state action against mine closings asked that under no conditions should the matter be turned over to the Kansas Industrial Court, so thoroughly detested by union labor and so bitterly assailed by Governor Davis during his campaign for election last autumn. Governor Davis has announced, however, that the case of shutdown mines may be referred to the court anyway. **Union officials of District 14** have answered many inquiries from members saying the organization **will not approve any co-operative mine leases for miners who want to try running mines.**

A mule fell on **Harry McGoey,** an employee of the Clemens Coal Co., in the company's No. 18 mine Feb. 15. The man died on April 14. His widow and son were awarded $3,118 in the District Court at Pittsburg.

J. F. Klaner, of the Klaner Coal Co. of Pittsburg, left April 17 for Kodiak, Alaska. After three weeks of bear hunting there, Mr. Klaner intends to go to Whale Island, where he is part owner of a blue fox farm, staked and stocked by him and a partner a little more than a year ago.

KENTUCKY

Bids for coal for the seven state penal and charitable institutions of Kentucky will be received until May 8, according to an announcement by B. T. Brewer, secretary of the State Board of Charities and Corrections. Announcement of the successful bidders will be made May 10. The seven institutions last year used approximately 37,000 tons of coal, ranging in price from

$1.55 to $5 the ton. No contracts were made last year on account of the coal and railroad strikes.

MINNESOTA

The Pure Carbon Co., Wellsville, N. Y., recently appointed as its Minneapolis representative, the **Charles A. Etem Co.**, 917-A Marquette Avenue.

MISSOURI

The sale of all stock in the Jackson-Walker companies of Kansas City, Mo., held by Mrs. L. C. Jackson, of Wichita, Kan., and Mrs. George T. Walker, of Kansas City, to C. P. A. Clough, president of the five companies, has been announced. The transfer gives Mr. Clough 49 per cent of the stock of the Jackson-Walker Coal & Mining Co., with capital stock of $150,000; all stock of the Marceline Coal & Mining Co., Marceline, Mo., capital stock $80,000; 50 per cent of the stock of the Toluca Coal Co., Toluca, Ill., capital stock $125,000; complete control of the Jackson-Walker Mercantile Co., Frontenac, Kan., capital stock $50,000, and of the Marceline Mercantile & Supply Co., Marceline, Mo., capital stock $20,000. J. A. Parkinson, secretary-treasurer of the companies, is the only other stockholder. He holds 51 per cent of the Jackson-Walker Coal & Mining Co. stock and 50 per cent of that of the Toluca Coal Co.

James F. Walsh and others have chartered the **Donald Coal Mines** for coal production in the vicinity of Westernport, the capitalization being $250,000.

T. H. Walton, head of a large coal company in Higbee, reports that **it is possible that his mine will have to close down for the summer** at least, unless he can obtain a renewal of the contract with the Chicago & Alton R.R., which expired April 1. Walton has been in Chicago, where he has been conferring with officials of the road relative to a new contract. The mine is one of the largest in this section of the state. There is practically no demand for commercial coal from local mines because of Illinois competition.

The mine of the **Marriott Coal Co.** in Moberly **has been reopened** following a 10-day shutdown. A new wage scale has been made.

NEW HAMPSHIRE

On April 19 the House rushed through a bill patterned after the Massachusetts law, giving authority to state and local boards of trade and sealers of weights and measures **to inspect all coal coming into the state and to condemn and confiscate all coal unfit for ordinary use.** Dealers are prohibited from selling coal with any foreign substance which impairs the quality. Fines from $100 to $1,000 and imprisonment from one month to one year are provided.

NEW YORK

The Coal & Iron National Bank has elected as vice-president **John M. Ross,** who for the past 18 months has been vice-president of the Lowry Bank & Trust Co., of Georgia.

OHIO

The Cincinnati School Board will open bids for approximately 30,000 tons of coal for the supply of its institutions on May 24.

Considerable development work is going on in various coal fields of the state of Ohio judging from the number of corporations chartered with the Secretary of State. Among the number are the **Nelsonville Consolidated Coal Co.,** of Nelsonville, with a capital of $25,000, chartered by D. H. Armstrong, R. S. Oxley, D. F. Shafer, A. H. Schory and A. P. Amann; **the Blowers Coal Co.,** of Bellaire, with a capital of $200,000 to mine coal in the eastern Ohio field by George A. Blowers, M. M. Weinstein, C. H. Poole, A. E. Clark and D. B. Brooks; **the Empire Mining Co.,** of Shawnee, with a capital of $12,000 by George W. Morgan, W. C. Edwards, John E. Nealson, E. B. Hopkins and William R. James; **the Standard Clay Co.,** of Empire, with a capital of $100,000 to mine coal among other things by Frank W. Stone, M. G. Bell, C. G. Jones, George S. Cotrell, and R. B. Holmes.

The Magnolia Coal Co., Magnolia, has been incorporated with a capital of $5,000 to mine and deal in coal both at wholesale and retail. Incorporators are H. E. Hunker, Paul G. Weber, Anne Zimmerman, Frank T. Bow and Agnes Parker.

Jerome Watson, St. Clairsville, Ohio, has been **appointed chief of the Ohio division of mine inspectors,** succeeding William Robinett, of Jacksonville. Mr. Watson formerly held the same position under the last administration of Governor James M. Cox.

Three large mines of the Ohio Collieries Co., near Athens, **were closed recently** for an indefinite period, and it was later announced that more of the big coal operators in the Hocking Valley field would suspend operations soon unless conditions in the fuel trade show marked improvement. The closing of the mines was due to a slump in trade brought on by the weather and the late opening of the lake trade.

I. H. Buchanan, general manager for the **Clay County Coal Co.** at Patchfork and the **Willis Harlan Coal Co.,** at Hima, Ky., was in Cincinnati recently purchasing new equipment.

PENNSYLVANIA

Several of the small coal-mining companies in the Connellsville region which last year signed the union scale of wages upon the condition that the union would keep them supplied with men, have **refused to renew the agreement this year.** The coal business being very unsatisfactory as to demand and prices a number of these operations have closed down indefinitely.

The Hudson Coal Co., the second largest anthracite taxpayer in the state, has carried **an appeal from the Auditor General's assessment** to the Dauphin County Court. The Philadelphia & Reading Coal & Iron Co., **has appealed to the State Supreme Court** from the Dauphin court's decision involving a half million tax.

The Burns bill, providing that mining and distribution of coal be placed under the jurisdiction of the Public Service Commission and that all coal-carrying and coal-producing corporations be subjected to the supervision of the commission as public utilities, **was defeated** in the House April 24 by a vote of 55 to 110. There was no debate on the bill. Representative Burns did not even explain its provisions to the House. Representative Whiteman, of Westmoreland, who opposed the measure in committee, merely stated to the House that it proposed to put all coal corporations in the state under the Public Service Commission.

A preliminary injunction has been granted in the court at Ebensburg, Cambria County, **the Sterling Coal Co.,** against E. P. Reed and Robert Reed, trading as the Reed Coal Co. at Bakerton, Cambria County. The injunction is to restrain the defendant company from mining coal in West Carroll township, the plaintiff company claiming ownership of the "B" seam, comprising some 85 acres, and that the defendant company has no right in or upon the tracts mentioned in the bill and would interfere with the plaintiff's operations.

Stanley Guoga, of Wilkes-Barre, pleading guilty April 25 before Judge Fuller on the charge of violating the mine act of June 2, 1891, **in smoking a cigarette in the mines** of the Lehigh & Wilkes-Barre Coal Co., **was fined $200** and sentenced to serve one month in the county jail. Sentence was suspended, and the defendant was paroled on condition that he pay the costs and $100 into court for charitable purposes. The money must be paid within 60 days.

Judge John A. Berkey of Somerset County on April 26 granted **a preliminary injunction** on a bill of equity filed by the Quemahoning Coal Co. **to restrain union officials from any procedures such as congregating, picketing, etc.** The defendants named are John Brophy, individually, and as president of District No. 2, U. M. W. of A., and others, including all the officers of District No. 2, and organizers employed by them. May 4 has been fixed for the time of hearing at the court house in Somerset. It is alleged in the bill that the defendants have been interfering with the company's operations at the mines at Harrison.

The Central Cambria Coal Mining Institute held a meeting in Portage on April 25 and **elected the following executive board:** Wallace Sherbine, general manager of the Portage-Wilmore Coal Co.; Patrick J. Keenan, Plymouth Coal Mining Co.; James West, Sonman Shaft Coal Mining Co.; F. M. Fahey, of the Gorge Coal Mining Co., and S. R. Kellerman, of the Sonman Shaft Coal Mining Co.

The Sugar Notch Colliery of the Lehigh & Wilkes-Barre Coal Co. was **shut down April 9 by the refusal of a miner to accept other work** when it had become dangerous for him to continue the employment on which he was engaged. He refused to work anywhere else in the mine. The aggrieved miner arrived at the mouth of the shaft with a member of the Grievance Committee, stopped the inside men from going to their labor and prevailed upon the breaker employees to go home. The colliery was unable to operate, 816 men being forced into idleness. The loss of production is about 1,800 tons daily.

The Hazle Brook colliery of the Wentz Coal Co. has resumed operations after being idle ten days. The excavation of coal from strippings near the breaker was conducted with such speed that the work of taking off the top layer of clay and rock could not keep pace and the miners had to lay off while the steam shovels caught up with the task of making the anthracite measures accessible.

The report of the **Pennsylvania Coal & Coke Corporation** and subsidiaries for the first three months of 1923 shows **gross earnings of $2,351,348.71,** with operating expenses and taxes, not including federal taxes, of $1,946,592.82. Miscellaneous income amounted to $36,048.97. The net income before federal taxes for the quarter, after deducting charges to income of $51,323.58, was $389,481.28. Tonnage shipped during the three months was 616,375 tons. James A. Hamilton, president of the W. F. Gilbert Co.; of New Haven, Conn., and Edward H. Everett were elected directors of the corporation to succeed R. H. Williams, Sr., and R. J. Doherty, resigned. The annual meeting will be held on May 7.

The Shade Coal Mining Corporation, which is the operating company for the Emerson & Morgan Coal Mining Corporation, of No. 1 Broadway, New York City, **has taken over the Antoinette Mine** of the Frauenheim-Logansport Coal Co., located on the Western Maryland R.R. in Somerset County, and production will commence at once. The coal is a smithing and byproduct fuel and is classified in Pool 9.

Charles F. Hall has resigned his position with the Equipment Corporation of America and **has organized and controls the Acme Equipment Co.,** contractors and dealers in railroad and mining machinery, 207 Fulton Building, Pittsburgh.

The Philadelphia & Reading Coal & Iron Co. has awarded a contract to the Ball Lumber Co. for the construction of ten additional blocks, making twenty houses, at Branchdale. Work has already begun. This makes a total of **seventy-two new houses either building or about to be built** in the Reading's spring program. Ground is now being prepared for the 18-house operation at the East colliery, at Big Mine Run, near Ashland. These houses will be in an unusually good situation on a hillside commanding an extensive view of the Mahanoy Valley, and the village seems certain to become one of the showplaces in that district. It will be known as Woodside, its site being on what was formerly known as Woodside Park.

The following bituminous coal companies were chartered at Harrisburg recently; **Meadow Brook Fuel Co.,** mining coal and manufacturing coal, Uniontown; capital stock, $20,000; Thomas M. Whyel, Uniontown, treasurer; incorporators, Thomas M. Whyel, Elizabeth P. Whyel and Frances P. Hutchison, Uniontown. **Douglass Brothers Coal Co.,** R. F. D. 3, Beaver Falls; $10,000; producing, mining and selling coal; treasurer, E. T. Douglass, who with David Douglass, R. F. D. 3, Beaver Falls, and H. A. Douglass, New Brighton, is an incorporator.

State Senator Robert D. Heaton, Schuylkill County, **introduced two bills** in the Senate April 24 **amending the workmen's compensation act** of 1915. One of these continues compensation in case of remarriage, and the other provides that the first day of disability shall be included as one of the ten days during which no compensation shall be paid and that the computation of the 300-week period in cases of death shall start with the day after death except where the death occurs within the ten-day period after an accident, in which case compensation shall be paid beginning the tenth day after the accident.

A state charter was issued recently to the **Cohen Mitchell Coal Co.,** Lewistown, Hyman J. Cohen, Lewistown, is treasurer, and the capital stock is $100,000. The incorporators are Hyman J. Cohen, Harold D. Cohen and James W. Mitchell, Lewistown.

The following bituminous coal companies have recently been incorporated: **Superior Coke Co.,** Latrobe, $100,000, Joseph M. Steele, Latrobe, treasurer. Incorporators, C. A. McFeely, Pittsburgh; F. B. McFeely, Latrobe and Frank O. Keltz, Latrobe. **H. A. Davis & Co.,** Pittsburgh, $500,000; D. R. Davis, Pittsburgh. Incorporators: H. A. Davis, H. R. Davis and H. B. Day, Pittsburgh, **Anderson Fuel Corporation,** Pittsburgh, $25,000; Guy D. Anderson, Aspinwall. Incorporators: Guy D. Anderson, Aspinwall; Bruce Harrison, Aspinwall, and Raymond B. Gabler, Pittsburgh.

A. W. Bittner has been appointed by the Consolidation Coal Co. as referee in all disputes arising between employees of the company at its mines in Somerset County.

TENNESSEE

O. P. Pile, Chief Mine Inspector, **will hold an examination for mine foremen** at the Government Building in Knoxville, May 22, 23 and 24.

VIRGINIA

The Virginia Coal & Coke Co. reports for the first quarter of 1923 net earnings of $243,559 after payment of interest, taxes etc. This is equivalent, after preferred dividends, to $1.81 a share earned on $10,000,000 outstanding common stock. While less than the net earnings of $273,184, or $2.10 a share, in the preceding quarter, it is a striking increase over the corresponding period of 1922, when the company returned a net loss of $81,047. The gross earnings for the first three months of 1923 were $351,752.

At the annual meeting of the **Mead-Toliver Coal Co.** a resolution was passed **to change the name of the company to the Killarney Smokeless Coal Co., Inc.** The principal office to be in the Peoples Bank Building, Lynchburg. The company was formerly under the management of C. H. Mead, Beckley, W. Va., but the present officers are as follows: James Gorman, president and treasurer; Dr. J. H. Craft, vice-president; G. H. Nowlin, Jr., secretary. The directors of the company are James Gorman, John J. Morrison, G. H. Nowlin, Jr., Philip Konrad, George W. Craft, Dr. J. H. Craft and J. A. Morrison.

WEST VIRGINIA

The Bertha Coal Co., Pittsburgh, Pa., **plans extensive improvement and enlargement of its Frances Mine, at Cresaps**, near Moundsville, on the Ohio River division of the Baltimore & Ohio RR. Approximately $300,000 will be expended for the erection of a new rail and river tipple, thus insuring steady operation of this plant, since at the present time shipment is being made by rail only. Modern shaker-screen equipment of the latest type as well as the erection of a number of new houses is included in the expenditure. The Frances Mine is now producing about 1,000 tons of coal daily, which will be increased to 2,500 tons when these improvements are completed.

Beckley people have organized the **Raleigh Peerless Coal Co.** with a view to developing coal properties in the Winding Gulf region, the new concern being capitalized at $100,000. The office of the company will be at Beckley. Among those interested are G. E. Thompson, Bernadine Norris, W. W. Goldsmith, H. M. Kilgore, and W. G. McClure.

C. H. Mead and associates have organized the **Faith Pocahontas Coal Co.**, Mr. Mead having been elected president. This company will at once proceed to develop its large holdings in the near future, several thousand acres of smokeless coal land on Milam Fork Branch of the Virginian Ry. being owned. Unless there are some unforeseen delays it is believed that it will be possible to begin shipping coal before the end of the year.

The West Virginia Rail Co., Huntington, purposes spending $290,000 to add another unit to its plant to manufacture frogs, switches, steel mine ties and timbers.

The Blake-Towson Coal Co. has been organized by Kingwood people with a view to operating in the Preston County field, having a capital stock of $125,000. Offices of the company are to be at Tunnelton. Chiefly interested in the new enterprise are G. C. Blake and Edith D. Blake of Cumberland, Md.; M. P. Blake, of Tunnelton, and Nora A. Towson of Kingwood.

Walter R. Thurmond and others prominent in the mining industry of Logan have **launched the Perry Branch Coal Co.**, the headquarters of which are to be at Kleencoal. The company has a capital stock of $25,000. Associated with Mr. Thurmond in the new company are W. L. Harvey, of Kleencoal; Innis D. Thurmond and R. J. Sellman, of Logan.

The Brighton Coal Co. has been launched by J. M. G. Brown and others of Morgantown, with a capital stock of $150,000. Mr. Brown and some of his associates recently purchased the holdings of the American Gas Coal Company at a sale decreed by the circuit court of Monongalia. Interested in the new company are: J. M. G. Brown, Robert D. Hennen, Louise R. Hennen, Mary B. Brown and T. Frank Burk.

The report of special commissioners Frank Cox, James R. Moreland and Edward G. Donley having been submitted and confirmed, **sale of the property of the American Gas Coal Co.** for $301,600 to J. M. G. Brown and Robert G. Hennen, under a decree of the court, has been confirmed.

The Island Creek Coal Co. reports operating profits of $990,656 for the first quarter of 1923, against $1,021,627 in the corresponding period last year. After allowing for depreciation and depletion reserves and estimated federal taxes there was reported net earnings available for dividends of $738,276, against $760,496 in the first three months of 1922.

With a view to operating in the Harrison County mining region, **the Evert Coal Co. has been organized**, having a capital stock of $25,000. Offices of the company are at Clarksburg. Active in organizing this concern were D. H. Dent, of Pickens; E. M. Pearcy, K. G. Davis, J. A. Farrell and O. L. Karichoff, all of Clarksburg.

Coal production in 1922 in the Pocahontas field, which totaled 15,073,908 tons, according to figures compiled by the Pocahontas Operators' Association, was the third highest in the history of the field. In 1916 there was produced in and shipped from the field 16,171,782 and in the following year a total of 15,156,353. In 1921 only 12,184,390 tons were shipped. Since the opening of the Pocahontas field in 1883 a total of 268,863,716 gross tons of coal have been shipped.

An injunction granted New River operators some time ago will remain in force until either the operators or the United Mine Workers seek to have it changed, and in either event **six months notice is to be given by the party seeking to change the status of the injunction.** That in substance is the gist of an agreement reached between counsel representing the McKell Coal & Coke Co., the Jones and other interests in the New River field and the United Mine Workers of America. An order to this effect has been filed with the clerk of the District Court for the southern district of West Virginia. Judge McClintic issued the injunction last summer, an appeal being taken by the United Mine Workers to the U. S. Circuit Court of Appeals. The agreement of counsel on each side—C. J. VanFleet for the United Mine Workers, and J. W. Maxwell for the operators—will apply to the appeal in the court of appeals and the case will be continued from term to term until either one side or the other seeks a change, provision having been made that in such an event, the six months notice will be required as has been agreed upon for the lower court.

WISCONSIN

Emil J. Earling, president of the Central Coal Co. of Milwaukee, announces that the **company has sold its coal docks in Milwaukee and at Escanaba, Mich.**, to the Industrial Coal Co., of Pittsburgh. The Central Coal Co. will in the future, Mr. Earling says, confine its activities to the operation of its mines in Illinois and the sale of rail coal. The company has operated its docks in Milwaukee for eighteen years.

Emphatic denial of the reported consolidation of the C. Reiss coal interests with the Pittsburgh Coal Co.'s dock holdings throughout the Northwest has been entered by various persons in both companies, notably Peter Reiss, who was recently made a director of the Pittsburgh Coal Co. He said he had been interested in the Pittsburgh company for years and his election as a director to fill a vacancy had no significance. Northwest officials of the Pittsburgh company also deny the story, saying that although a consolidation was considered at one time, there is no likelihood of it now.

WASHINGTON, D. C.

The use of industrial motion pictures has reached a point where the Secretary of the Interior believes a more **uniform policy should be adopted in the preparation of such films.** The various bureaus of the department heretofore have proceeded separately without regard to a common policy. There has been some criticism of government films on the ground that they give undue advertising to certain companies. A thorough investigation of the whole subject is being made with the idea of establishing a policy and with the idea of materially expanding the production of this type of motion picture.

A request that American coal producers submit bids in connection with a purchase of 150,000 tons of coal which the Central Railway of Brazil expects to make on May 19 has been received at the U. S. Department of Commerce.

The Bureau of Supplies and Accounts of the **Navy Department, will open bids** at noon on May 10 for furnishing and delivering about **22,450 gross tons of various sizes of anthracite** at various points along the Atlantic coast and Great Lakes, Ill. Detailed information may be obtained at the office of the bureau.

CANADA

At the recent annual convention in Toronto of the **Canadian Retail Coal Dealers' Association** interest was manifest in the possibilities of Alberta coal for Ontario, but it was the general feeling of the merchants that they would have to move warily for the present, until the probable lower cost at the mines, the prospect of lower freight rates and the qualities of the different kinds of coal had been more fully investigated. It was felt by most of the delegates that the Government commissions for the supply of coal for domestic use had so far been a waste of public money and the government is to be asked to discontinue the appointment of these so-called useless bodies. G. F. Rogers, of St. Catherines, Ont., was elected president: W. H. Smith, Owen Sound Ont., vice-president, and B. A. Campbell, Brantford, Ont., secretary-treasurer.

COAL OUTPUT OF BRITISH COLUMBIA, MARCH, 1923

VANCOUVER ISLAND DISTRICT

Mine	Tons
Canadian Collieries (D) Ltd.,	
Comox	20,675
Extension	21,337
South Wellington	10,853
Western Fuel Corporation, Nanaimo:	
Reserve Mine	21,836
No. 1 Mine	30,009
Wakesiah Mine	10,256
Granby Consolidated, Cassidy	21,758
Nanoose-Wellington Collieries, Lantzville	9,533
Old Wellington, Nanaimo	920
Total	147,177

NICOLA-PRINCETON DISTRICT

Middlesboro Collieries, Middlesboro	7,999
Fleming Coal Co., Merritt	881
Coalmont Collieries, Coalmont	12,209
Princeton Coal & Land Co., Princeton	812
Total	21,901

CROW'S NEST PASS DISTRICT

Crow's Nest Pass Coal Co., Coal Creek	45,312
Crow's Nest Pass Coal Co., Michel	29,900
Corbin Coal & Coke Co., Corbin	4,297.09
Total	79,509.09
Grand total, March	248,587.09

Canadian mines during December last produced 1,734,000 net tons of coal, making the output for the calendar year 15,045,000 tons, or 2 per cent below the three-year average of 15,307,800 tons, according to a statement issued by the Dominion Bureau of Statistics. **Imports** of coal for December **amounted to 2,307,000 tons**, or 471,000 tons less than in the preceding month but 67 per cent more than the three-year average for the month. For the calendar year imports were 14,255,600 tons, while the three-year average for the same period was 18,634,000 tons. A slight decrease in exports of Canadian coal was recorded, **166,200 tons being exported during the month** as compared with 169,000 tons in November, a decrease of 2 per cent. The record for the year 1922 equalled 82 per cent of the three-year average. There was available for consumption in Canada during December 3,875,000 tons, which when compared with the three-year average for the month was 40 per cent greater. The coal available for consumption in Canada during the year was 27,482,300 tons as compared with a three-year average of 31,736,800 tons, a decrease of 14 per cent.

Coal Mines of British Columbia used 26,762,001 ft. of timber, including 12,279,871 ft. of mine props and 10,740,000 ft. of butts, last year.

Coke made from bituminous coal as a substitute for United States anthracite was under discussion in the Senate Committee on Fuel Supply for Canada when C. B. Bagg, of the Montreal Heat & Power Co., stated that his company had marketed up to 150,000 tons of domestic gas coke a year. The coke output was limited to the quantity of gas which could be used, so that it was not practicable to encourage more people to use coke.

Members of the Western Canada Coal Operators' Association in session at Calgary passed a **resolution against the proposed amendments to the Industrial Disputes Act** that would mean, in brief, **consideration of the arbitration board's report before wages could either be reduced or increased.**

Publications Received

Production of Explosives in the United States During the Calendar Year 1921, by Wm. W. Adams, Bureau of Mines, Washington, D. C. Technical paper 313. Pp. 25; 6 x 9 in.; tables.

An Investigation of the Properties of Chilled Iron Car Wheels, by J. M. Snodgrass and F. H. Guldner, Engineering Experiment Station, University of Illinois, Urbana, Ill. Part III. Bulletin No. 135. Pp. 100; 6 x 9 in.; illustrated. Covers strains due to brake application, coefficient of friction and brake-shoe wear.

Mine Power, by W. R. Woolrich, University of Tennessee, Engineering Experiment Station, Knoxville, Tenn. Bulletin No. 2. Pp. 49; 6 x 9 in.; illustrated. Factors in the economical generation, distribution and maintenance of electric power and power equipment in the coal mines of Tennessee and Kentucky are the subjects touched upon in this bulletin.

"Howdy" is the name of a little bulletin which has recently made its appearance. It is published monthly by The Morrison & Risman Co., Inc., of Buffalo, N. Y., and a copy may be had by dropping a postcard to them. It is devoted to fun and facts.

Recent Patents

Coupling for Mine Cars. F. W. Fries and Wm. J. Fries, Carlinville, Ill.; 1,439,158. Dec. 19, 1922. Filed March 3, 1922; serial No. 540,760.

Coal Screening and Washing Machine. Wm. F. Martin, Wormleysburg, Pa.; 1,439,252. Dec. 19, 1922. Filed May 18, 1922; serial No. 561,981.

Coal-Washer Jig. Louis MacKenzie and Wm. Richardson, Jr., Ensley, Ala.; 1,439,431. Dec. 19, 1922. Filed March 18, 1922; serial No. 544,863.

Mining Machine Jack. Morris P. Holmes, Claremont, N. H., assignor to the Sullivan Machinery Co., Chicago, Ill.; 1,439,677. Dec. 19, 1922. Filed April 2, 1919; serial No. 287,025.

Crusher. Milton F. Williams, St. Louis, Mo., assignor to the Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.; 1,439,781. Dec. 26, 1922. Filed July 1, 1922; serial No. 572,135.

Crusher and Pulverizer. Harold M. Plaisted, St. Louis, Mo., assignor to Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.; 1,439,754. Dec. 26, 1922. Filed Aug. 8, 1921; serial No. 490,617.

Hammer Rod for Crushers. Wm. M. Davidson, St. Louis, Mo., assignor to the Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.; 1,439,800. Dec. 26, 1922. Filed July 28, 1922; serial No. 578,176.

Cage Partition Plate for Crushers. Wm. M. Davidson, St. Louis, Mo., assignor to the Williams Patent Crusher & Pulverizer Co., St. Louis, Mo.; 1,439,872. Dec. 26, 1922. Filed Sept. 11, 1922; serial No. 587,433.

Miners' Knife. Henry Kallio, Painsdale, Mich.; 1,440,014. Dec. 26, 1922. Filed April 5, 1920; serial No. 371,350.

Obituary

Frederick Marietta, formerly a mine superintendent of the Stickel & Frank coal interests at Connellsville, Pa., died April 17. He was a graduate of the Carnegie Institute of Technology in Pittsburgh in the co-operative department of mining engineering, and also received a diploma from the U. S. Bureau of Mines in first-aid and mine-rescue work. During the recent war he was assigned to the Wissahickon Barracks at Cape May.

Traffic News

The Smokeless Fuel Co. takes exception to a tentative report involving numerous shipments between the company's mines and Lamberts Point, in which certain demurrage charges were approved. The company contends that the demurrage charges are in excess of those that would have accrued had the railroads released from demurrage account cars which had been dumped prior to the registry of their respective vessels. The Norfolk & Western contends that the tariff and not the exchange rules is the basis for the assessment of demurrage charges. The record will not support a finding, the carrier contends, that the computation of detention by subtracting the date of car arrival from the date of release of equivalent tonnage, without allowing any additional credit for the days elapsing between the date of dumping and the subsequent date of arrival of equivalent cars in transit, is unjust and unreasonable, or contrary to the applicable tariff.

Freight rates on coal from northern Alberta mines to Prince Rupert **have been raised $1 per ton,** according to notices sent out by the Canadian National Railways.

In a complaint filed by the Winding Gulf Colliery Co., the Interstate Commerce Commission is asked **to require the Chesapeake & Ohio Ry. and the Virginian Ry. to interchange at Pemberton** and not discriminate in the rates applied upon coal traffic interchanged at that point. The commission is asked to require the railroads to provide other facilities and service and to establish New River district rates on coal traffic interchanged within the district from the complainant's mines.

The Northern West Virginia Coal Operators' Association, in a traffic case against the Pennsylvania R.R., points out that in July, August, September and October, of 1919, mines on the Monongahela Ry. had an average car supply of 81.9 per cent. During December, January and February, following, the average supply was 54.6 per cent. On the other hand, it was declared that mines on the Pittsburgh & Lake Erie and on the Monongahela division and Pittsburgh West End Division of the Pennsylvania, received 90.5 per cent car supply during the first period and 60.5 per cent during the second period. Had cars been distributed on a pro-rata basis, the mines operated by members of the Northern West Virginia Coal Operators Association would have received an average of 87 per cent car supply. For that reason it is contended that mines on the Monongahela were subjected during those periods to prejudicial action and are entitled to reparation.

Increases in the rates on coke from the Cleveland ovens to points in New York State, which the Wheeling & Lake Erie R.R. proposed to put into effect May 1, **were suspended** April 26 by the Interstate Commerce Commission until Aug. 29, to allow investigation. The present rate on coke to all of the northern New York territory from Cleveland is $2.39 per ton, the commission order said, while the suspended Wheeling & Lake Erie schedule proposed to make new rates to Niagara Falls at $2.76 per ton, to Lockport $3.40 and to North Tonawanda $3.19.

Questions involved in the case of the **Northern West Virginia Coal Operators' Association vs. the Pennsylvania R.R.** will be considered at an Interstate Commerce Commission hearing in Washington on May 15. Examiner McQuillan will preside.

Rates on bituminous coal from southern Illinois fields to Ste. Genevieve and Mosher, Mo., have been unreasonable since March 26, 1921, in the opinion of examiner Koch expressed in a tentative decision. Reasonable rates are suggested for the future and reparation should be paid, the examiner holds.

In the case of the Big Mandy Coal & Mining Co., the Interstate Commerce Commission holds that **the rates on coal from mines on the Lenox R.R. to Cincinnati and points in the Cincinnati switching district, as well as to points in Central territory, are unreasonable.** Reparation was awarded and reasonable rates prescribed for the future.

Thomas Moore, purchasing agent of the Virginian Ry., is authority for the statement that **orders for equipment** for that road placed since Jan. 1 **aggregate $6,000,000.** On April 12 the company ordered 1,000 all-steel gondola cars having a capacity of 120 tons and 500 all-steel hopper coal cars of a capacity of 70 tons. In January the road ordered 15 freight locomotives.

The Hood Coal Co., Wilmar Coal Co., Cava Coal Co. and Mack Coal Co., operating in the vicinity of Shinnston, W. Va., have filed a petition with the Interstate Commerce Commission asking reopening of their case with a view to **placing them on the same rate basis as enjoyed by other companies in the field.** The petition states that "a comparison of rates shows that the complainants' mines are well within the distance limits of the group taking the Fairmont rate to Eastern and Western destinations.

Coming Meetings

The American Wholesale Coal Association will hold its annual convention June 12 and 13 at the Gibson Hotel, Cincinnati, Ohio. Secretary, G. H. Merryweather, Union Fuel Bldg., Chicago, Ill.

Illinois and Wisconsin Retail Coal Dealers' Association will hold its annual meeting June 12-14 at Delavan, Wisconsin. Secretary, I. L. Runyan, Great Northern Building, Chicago, Ill.

Southwestern Interstate Coal Operators' Association will hold its annual meeting June 12 at Kansas City, Mo. General Commissioner, W. L. A. Johnson, Kansas City, Mo.

Pennsylvania Retail Coal Merchants' Association will hold its annual meeting May 23 and 24 at Wilmington, Del. Secretary, W. M. Bertolet, Reading, Pa.

American Association of Mechanical Engineers will hold its spring meeting at Montreal, Quebec, Canada, May 28-31. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

National Association of Purchasing Agents will hold its eighth annual convention and Informashow at Cleveland, Ohio, May 15-18. Convention headquarters, room 219, Hotel Winton, Cleveland.

The National Association of Manufacturers will hold its 27th annual convention at the Waldorf-Astoria, New York City, May 14-16.

New England Coal Dealers' Association will hold its annual meeting at Providence, R. I., June 13-15. Secretary, C. R. Elder, Boston, Mass.

National Retail Coal Merchants' Association will hold its sixth annual convention June 25, 26 and 27 at Scranton, Pa., with headquarters at the Hotel Casey.

National Safety Council will hold its twelfth annual safety convention at the Buffalo Statler Hotel, Buffalo, N. Y., Oct. 1-5. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

International First-Aid and Mine-Rescue meet will be held Aug. 27-29, at Salt Lake City, Utah.

American Institute of Electrical Engineers will hold its annual convention June 25-29, at Swampscott, Mass. Secretary F. L. Hutchinson, 29 West 39th St., New York City.

International Railway Fuel Association will hold its spring convention at the Hotel Winton, Cleveland, Ohio, May 21-24, Secretary-treasurer, J. G. Crawford, Chicago.

The American Mining Congress will hold its twenty-sixth annual convention in conjunction with the **National Exposition of Mines and Mining Equipment,** Sept. 24-29, at the Milwaukee Auditorium, Milwaukee, Wis. Secretary, J. F. Callbreath, Washington, D. C.

American Society for Testing Materials will hold its annual meeting at the Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., beginning June 25 and continuing throughout the week. Secretary, E. Marburg, Philadelphia, Pa.

The Colorado & New Mexico Coal Operators' Association will hold its annual meeting June 20 at Denver, Col. Secretary, F. O. Sandstrom, Denver, Col.

The Electric Power Club's annual meeting will be held at the Homestead, Hot Springs, Va., June 11-14. Executive secretary, S. N. Clarkson, Cleveland, Ohio.

The eleventh annual meeting of the Chamber of Commerce of the United States will be held in New York City May 7-10.

National Coal Association will hold its sixth annual convention June 19-22 at Atlantic City, N. J. Assistant secretary, C. C. Crowe, Washington, D. C.

Michigan-Ohio-Indiana Coal Association will hold its annual convention at the Hotel Sinton, Cincinnati, Ohio, May 22-24. Secretary, B. F. Nigh, Brunson Bldg., Columbus, Ohio.

West Virginia Coal Mining Institute has tentatively set June 5 and 6 for its annual meeting, to be held at Clarksburg, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

Retail Coal Dealers' Association of Texas will hold its eighteenth annual convention at Galveston, June 11 and 12. Secretary, C. R. Goldmann, Dallas.